















*Pa. Collection of Levels of Railroads, &c*  
*made for*

SECOND

GEOLOGICAL SURVEY OF PENNSYLVANIA

J. P. LESLEY, STATE GEOLOGIST.

1008 Clinton Street, Philada., May 11, 1876.

To Mr.

SIR:

By order of the Board of Commissioners of the Geological Survey, I detailed Mr. Charles Allen, of Harrisburg, to the special work of collecting and collating the Levels of the State, for the use of the Geological Corps, Railway Engineers, County Surveyors, and other citizens.

Mr. Allen's preliminary tables were considered by the American Philosophical Society to be of sufficient scientific value to publish in their Proceedings at the expense of the Society.

Three hundred extra copies were struck off for the use of the Survey, which I have instructed Mr. Allen to distribute by mail to those who furnished him with data, and to others who may be likely to aid in correcting and enlarging the record.

Please find enclosed *two* (duplicate) copies mailed to your address; one, to be kept by you for present use, and *the other* to receive your notes, corrections, additions, criticisms, explanations, or remarks, and to be mailed to the following address:

MR. CHARLES ALLEN,

OFFICE OF THE SECOND GEOLOGICAL SURVEY,

223 MARKET STREET,

Harrisburg, Pa.

When all the duplicate copies are returned, and their notes discussed, the Levels of the field-parties of the Survey got during 1874, 1875, will be added, and the whole will then be published as one of the regular series of Reports of the Survey, with the title:

REPORT OF PROGRESS FOR 1876

LEVELS OF PENNSYLVANIA

BY CHARLES ALLEN.

I trust that you will feel a real pleasure in taking part in this important piece of State work, and give the subject your earliest and most careful attention.

With great respect, your obedient servant,

J. P. LESLEY.

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*Contributions to the Physical Geography of the United States,  
by Charles Allen, Assistant in charge of the Collection and  
Collation of Railroad and other Levels for the Second Geolog-  
ical Survey of Pennsylvania.*

BY J. P. LESLEY.

*(Read before the American Philosophical Society, January 15, 1876.)*

In presenting to the attention of the members Mr. Allen's list of Pennsylvania levels, I have only to say that the progress of physical geography in the United States has been so rapid, of late years, as to attract the attention of the Scientific world at home and abroad, and that its connection with the progress of geological science is so intimate, that working geologists hail with lively pleasure the publication of all hypsometrical records of a genuine kind, whether old or new. For want of government bureaus of statistics the greater part of such records have been irrecoverably lost. Of the tentative work of our railway, canal, slackwater and turnpike companies, done between 1830 and 1860, scarcely a trace remains; although, if its records could be recovered and printed, they would furnish copy for hundreds of volumes. Since 1860 the destruction has not been so complete, but has been nevertheless very great. There are recent important surveys of which no records can be found, even in the offices of the companies for whom they were made.

This important subject has received well-deserved attention at the hands of the chiefs of the United States Exploring Expeditions, who are mapping the interior of the Continent. But some efficient organization is required for the preservation and publication of levels in the States lying between the Atlantic and the Mississippi.

The State Geologists of Ohio and North Carolina, also, have published valuable hypsometric tables.

A beginning has now been made in Pennsylvania; and the following pages contain the records of the height above some assumed datum, reduced to tide level, of all stations on railways in the State, and in its immediate vicinity.

These records have mostly been obtained by personal examination of the profiles preserved at the offices; and in some cases, by letter, from superintendents and engineers. The greatest interest in the Collection has been manifested by members of the profession of Civil Engineering to whom application has been made; and in some instances, where records were wanting, new levelings have been ordered and the results transmitted.

Short headings are prefixed to the records, stating place, date and authority; and foot notes appended to them, stating difficulties of adjustment, incongruities, or doubts.

That a work of this nature should have the advantage of first publication in the transactions of the oldest Scientific Society of America, whose first President was Benjamin Franklin, and whose hall stands side by side with the ancient Capitol of the United States, is my reason for asking that this first systematic attempt on a large scale to render permanent and useful to all engineers and surveyors the scattered and perishable records of heights above sea-level of several thousand points in our valleys and on our mountains should be accepted by the Society.

It must be understood, however, that these lists require thorough re-examination and correction before they can be adopted as constants of science for the future. There are considerable difficulties yet to be encountered by such as undertake to harmonise the data of our railway surveys. Indeed, considering the imperfect way in which such surveys are necessarily made,—the accumulation of errors of instrumentation and personal equation along every long spirit-level line,—the uncertainty even of the tide-level datum at every head of tide,—the frequent lack of notes stating whether railway levels cross each other on grade, or not,—and the not uncommon fact that, after location-surveys have

been made, the road-beds have been tempered up, or down, to suit convenience, and no record of the fact been kept, except in the memory of some division engineer no longer in the employ of the Company,—it is surprising that the errors of terminal or crossing adjustment are so few and small. But to render the record perfect all such errors, however few and small, must be eliminated; and this can only be accomplished by a zealous interest taken in the subject by resident engineers; who are therefore earnestly requested to co-operate to this end.

Geologists are dependent for the goodness of their field-work on accurate base-line levels. And it is to be hoped that a complete exhibition of the surface contour of Pennsylvania will sooner or later be obtained from a collation of the thousands of transit-lines and barometer-lines now in progress in all the districts occupied by the Assistant Geologists of the Survey. All their lines of levels are, however, based on the railroad records, and the publication of these in a corrected form is a necessary preliminary step.

If movements are still taking place in the crust of the earth,—and the frequent occurrence of slight earthquake shocks, in all the States of the Union, seems to speak in favor of the supposition,—physical philosophers are peculiarly interested in an early establishment of a universal hypsometrical record. From this point of view, also, it would seem especially germane to the origin and history of the American Philosophical Society to initiate such a record.

The net-work of Surveys which cover Pennsylvania may be divided into nine systems:

1. The Pennsylvania Central east and west system, from Trenton through Philadelphia, Harrisburg, Altoona, Pittsburgh, to Steubenville, and Youngstown, in Ohio; with numerous longer or shorter side branches.

2. The Reading Railroad northwest and southeast system, with many short branches in the Schuylkill Anthracite Field, and through the country in front of it between the Delaware and Susquehanna Rivers. It has been extended also to the

waters of the Upper Susquehanna, and will penetrate into New York State.

3. The North Pennsylvania north and south system, with numerous branches in the Lehigh and Wilkesbarre Anthracite Fields, in connection with the two Lehigh Valley Railroads, extending into the State of New York.

4. The Northern Central north and south system, extending from Baltimore, in Maryland, to Elmira, in New York, with several short branches.

5. The Philadelphia and Erie northwest system, with important branches crossing to the Alleghany River, and into the State of New York.

6. The Alleghany River north and south system, from Pittsburgh to the Oil Region, and Buffalo in New York.

7. The Baltimore and Ohio system, with its Connellsville branch to Pittsburgh, and its short coal and coke branch.

8. The Beaver River system, north and south, along the western margin of the State.

9. The Philadelphia, Wilmington and Baltimore southwest system.

The following tables are arranged in the above order, and will explain themselves :

## I. THE PENNSYLVANIA R. R. SYSTEM.

### *I. Pennsylvania Railroad.*

NOTE.—The elevations at the various stations, on the Pennsylvania Railroad, were copied from the Engineers' notes, by permission of Mr. W. H. Wilson, its Consulting Engineer.

The datum, or base of levels, is ordinary high-water in Schuylkill River. This datum, according to Mr. James T. Gardener's determination, is 6.913 feet\* above mean surface of the Atlantic Ocean. *These 7 feet are added in the second column.* Decimal parts of a foot do not occur in these lists. When below .5 they have been omitted; when more than .5 a whole number has been substituted.

\*Permanent U. S. Coast Survey granite bench at Gloucester Ferry, N. J., opposite Philadelphia, is 8.10 above Mean Tide Raritan Bay, or Mean Ocean level. Mean Tide Delaware River =  $8.10 - 4.751 = 3.349$ . Philadelphia City Surveyor's datum:  $8.10 - 0.632 = 8.732$ . Pennsylvania R. R. Engineer's datum:  $8.10 - 1.819$  High tide, 6.913.

*Pennsylvania R. R. Main Line.*

STATIONS.	High Tide, Philad'a.	Above mean level Atlantic Ocean.
Philadelphia, Market Street.....	25	32
West Philadelphia.....	27	34
Powelton Avenue.....	38	45
Fairmount Bridge .....	44	51
Mantua.....	94	101
Belmont Avenue.....	103	110
Hestonville .....	136	143
City Avenue.....	214	221
Merion .....	240	247
Elm .....	278	285
Wynnewood .....	308	315
Ardmore.....	352	359
Bryn Mawr .....	409	416
Rosemont .....	388	395
Villa Nova.....	423	430
Union .....	423	430
Radnor .....	402	409
Edgewood Avenue.....	394	401
Wayne .....	398	405
Reeseville .....	488	495
Paoli.....	527	534
Green Tree.....	536	543
Malvern.....	539	546
Fraser .....	483	490
Glenlock.....	446	453
Ship Bridge *.....	404	411
Walkertown.....	381	388
E. B. & W. R. R. See Tab. II....	248	255
Downingtown .....	259	266
Gallaghersville .....	291	298
Thorndale.....	306	313
Cain.....	352	359
Coatesville(W.&R.R.R.)Tab.LVI.	373	380
Midway.....	387	394
Pomeroy. P. & D. R. R. Tab. III.	476	483
Chandlers .....	482	489
Parkesburg .....	530	537
<i>Summit</i> †.....	551	558
Penningtonville.....	493	500
Christiana.....	484	491
<i>Summit</i> ‡.....	566	573
Gap .....	552	559
Kinzers .....	461	468
Spindlers .....	397	404
Leamen Place .....	375	382
Gordonville .....	378	385
Fairview .....	378	385
Bird in Hand.....	352	359

\* Intersection of Waynesburg Branch.

† West of Parkesburg.

‡ East of Gap Station.



STATIONS.	High Tide, Philad'a.	Mean Tide Atlantic Ocean.	
Lancaster †.....	352	359	
Dillerville Junction ‡.....	352	359	
Rohrerstown §.....	345	352	
Mountville.....	397	404	
Columbia.....	244	251	Columbia Line.
Chiquies.....	248	255	
Marietta.....	253	260	
Shocks Mill.....	262	269	
Bainbridge.....	264	271	
Collins.....	278	285	
Middletown Junction (a). }.....	307	314	
Landisv'e R. & C. R. R. (b). Tab. LVII	398	405	
Salunga.....	396	403	
Chiquies Bridge.....	344	351	
Mount Joy (c).....	359	366	
Springville.....	383	390	
Reams.....	432	439	
Tunnel.....	472	479	
Elizabethtown.....	450	457	
Conewago.....	422	429	
Middletown.....	307	314	
Highspire.....	293	300	
Harrisburg *.....	313	320	
Susquehanna.....	335	342	
Susquehanna Bridge.....	343	350	
Marysville.....	343	350	
N. C. R. R. Crossing † Tab.	342	349	
Duncannon.....	349	356	
Aqueduct.....	370	377	
Bailys.....	380	387	
Newport.....	388	395	
Millerstown.....	401	408	
Thompstontown.....	412	419	
Tuscarora ¶.....	422	429	
Mexico.....	426	433	
Perryville.....	434	441	
Mifflin.....	434	441	
Black Log.....	455	462	
Bixlers.....	475	482	
Lewistown.....	491	498	
M. & C. C. R. R. Crossing ¶¶ Tab. V.	492	499	
Granville.....	491	498	

† Bench Mark on Stone Wall, Lancaster Locomotive Works, 339.

‡ Junction of Columbia Branch, at Dillerville.

§ On Columbia Branch.

(a) Junction of Columbia Branch, at Middletown.

(b) Reading and Columbia R. R. Crossing, at Landisville.

(c) East side of R. R. Hotel.

\* West line of depot 313.91. Curb stone at lamp post U. S. Hotel 313.54. West line of Lebanon Valley Depot 315.5. West line of State street 319.2.

† Northern Central R. R. Crossing.

¶ Bench Mark on top of Stone foundation west corner of Water Station 424.41.

¶¶ Junction at Mifflin and Centre County R. R.

STATIONS.	High Tide, Philad'a.	Mean Tide Atlantic Ocean.	
Anderson's.....	493	500	
Anderson's. Water Station.....	492	499	
McVeytown.....	515	522	
Manayunk.....	512	519	
Vineyard.....	541	548	
Newton Hamilton.....	592	599	
Mount Union. § E. B. T. Tab.VII.	590	597	
Jackstown.....	588	595	
Mapleton.....	586	593	
Mill Creek.....	597	604	
Huntingdon.* H. & B.T.Tab.VIII.	615	622	
Warrior Ridge.....	670	677	
Petersburg.....	671	678	
Sherman's Bridge †.....	692	699	
Barre Forge.....	717	724	
Tunnel ‡.....	754	761	
Spruce Creek.....	770	777	
Union Furnace.....	792	799	
Birmingham.....	859	866	
Tyrone Water Station.....	889	896	
Tyrone R.R. Tables XIII.XIV.XV.	900	907	
Tipton.....	983	990	
Fostoria.....	1022	1029	
Bells Mills R. R. Table XVIII...	1053	1060	
Elizabeth Furnace.....	1072	1079	
Blair Furnace.....	1107	1114	
Altoona    R.R. Tables XIX.-XXIII	1171	1178	
Kittanning.....	1587	1594	
Murdocks.....	1619	1626	
Alligrippus.....	1913	1920	
Bennington Furnace.....	2031	2038	
Tunnel ¶.....	2119	2126	
Gallitzin.....	2154	2161	
Cresson (a) E. & C.R.R. Tab.XXIV.	2010	2017	
Lillys.....	1880	1887	
Portage.....	1668	1675	
Wilmore.....	1550	1557	
Summit (b).....	1562	1569	
Summerhill.....	1550	1557	
South Fork.....	1477	1485	
Viaduct (c).....	1449	1456	

‡ Junction of East Broad Top R. R. (narrow guage).

\* West line of ticket office, crossing south track west to Huntingdon & Broad Top R. 613.9.

† Bench Mark on west end of bridge.

‡ West end of Spruce Creek Tunnel.

|| West line of ticket office 1171. B. M. (Bench Mark) south-west corner, top step front door of ticket office 1174.

¶ B. M. at east end of Tunnel, on rough part of first course of stone above foundation.

(a) Switch to Ebensburgh and Cresson R. R. 2021.

(b) Pringles point.

(c) Bench Mark on N. W. corner west end of coping.

STATIONS.	High Tide, Philad'a.	Mean Tide Atlantic Ocean.	
Mineral Point .....	1407	1414	
Conemaugh .....	1218	1225	
Johnstown .....	1177	1184	
Sandy Hollow .....	1136	1143	
Conemaugh Furnace .....	1128	1135	
Nineveh .....	1134	1141	
New Florence .....	1069	1076	
Houstons .....	1049	1056	
Lockport .....	1047	1054	
Bolivar .....	1026	1033	
Blairsville Junction * Tab. XXV.	1106	1113	
Hillside .....	1122	1129	
Millwood .....	1148	1155	
Derry .....	1165	1172	
Lindorff's Summit .....	1178	1185	
St. Clair { Lig. R.R. Tab. XXIX. }	1085	1092	
Latrobe { }	999	1006	
Beatty's .....	1066	1073	
Kearney's † .....	1041	1048	
Shanghai .....	1166	1173	
Carr's Tunnel ‡ .....	1201	1208	
George's .....	1199	1206	
Greensburg § S. W. P. R.R. Tab. XXX.	1084	1091	
McGraw's Tunnel § .....	1156	1163	
Radebaughs .....	1143	1150	
Grapeville .....	1052	1059	
Penn .....	967	974	
Manor .....	935	942	
Shafton .....	893	900	
Irwin's. Y. R. R. Table XXXI.	877	884	
Larimer's .....	859	866	
Carpenter's .....	847	854	
Stewart's .....	784	791	
Wall's .....	744	751	
Springhill .....	742	749	
Turtle Creek .....	743	750	
Oak Hill .....	743	750	
Brinton's .....	750	757	
Braddock's .....	821	828	
Copeland .....	846	853	
Hawkins' .....	876	883	
Swiss Vale .....	915	922	
Edgewood .....	916	923	
Wilkinsburg .....	916	923	
Brushton .....	915	922	

\* Intersection of Blairsville and Indiana Branch of Pa. R. R. with main line.

† Rogers' Summit 1201.8.

‡ East face of Tunnel.

§ B. M. east face of Greensburg Tunnel on top of rough part of second course from bottom 'R' 1079.52.

‡ West face of tunnel.

STATIONS.	High Tide, Philad'a.	Mean Tide Atlantic Ocean.
Homewood .....	916	923
Torrens .....	913	920
East Liberty.....	911	918
Roups' .....	875	882
Shadyside .....	859	866
Millvale.....	826	833
Lawrenceville .....	773	780
Pittsburgh *.....	738	745

## II. East Brandywine Railroad.

NOTE.—The levels on the East Brandywine and Waynesburg R. R. were furnished by Mr. W. H. Wilson, Consulting Engineer of the Pennsylvania R.R.

The datum, or base of levels is ordinary high water in Schuylkill River, Philadelphia. Therefore 7 feet are added in the second column to reduce to mean tide in the Atlantic Ocean.

STATIONS.	High Tide, Philad'a.	Ocean Level.
Downingtown Terminus. † Table I.	249	256
Shelmeirs .....	239	246
Dowlin's Forge.....	271	278
Dorlan's .....	273	280
Reed's Road .....	302	309
Brooklyn .....	329	336
Cornog's .....	354	361
Springton .....	398	405
Moorestown .....	436	443
Barnestown .....	479	486
Lewis Mills.....	535	542
Cupola .....	556	563
Forrest .....	564	571
Dampman's .....	624	631
W. & R. R. R. ‡ Table LVI.	666?	673?
Buchanan's .....	665	672
Lancaster Pike .....	689	696
Waynesburg .....	721?	728?
End of Track .....	734	741

\* West face of Union Passenger Depot, east side of Wayne Station 734.5. East side of Irwin street 729.7. East side of Duquesne street depot 725.4. Bench Mark at foot of lamp post south side of Liberty street, intersection with Water street 721.27.

Bench Mark on south side of base ring, of fire plug, north side of Penn street, intersection with Water street, 719.

† Junction with north track of the Pa. R. R. near Downingtown.

‡ Crossing Wilmington and Reading R. R.

### III. Pennsylvania and Delaware R. R.

NOTE.—The elevations on the Pennsylvania and Delaware Railroad were obtained in the office of Mr. George W. Leuffer, C. E., of Philadelphia.

At Pomeroy Station, 43 miles of Philadelphia, this road joins the Pennsylvania R. R. Mr. Leuffer makes this point 472.9; Mr. Wilson 476.039. To Mr. Leuffer's levels in the first column are therefore added 3 feet to accord with the P. R. R. list, and an additional 7 feet to reduce to mean Atlantic tide level.

STATIONS.	High Tide, Philad'a.	Ocean Level.	
Pomerey Junction * Table I.	472.9	483	
Doe Run .....	364	374	
Pusey's Summit .....	460.	470	
Pennock's Summit.....	453	463	
Avondale ** Table	271.6	281.6	
Newark †.....	108	118	
Delaware R. R. Crossing ‡.....	76.2	86.2	
Delaware City.....	6.	16	

### IV. York Branch P. R. R.

The levels on the York Branch of the Pennsylvania R. R. were copied from the profile in the office of the P. R. R. at Philadelphia.

In accordance with instructions of Mr. W. H. Wilson, 3' was added to each elevation, as shown on the profile, in order to agree with the level of Columbia according to Pa. R. R.; and also 7 feet to reduce to mean Ocean level.

STATIONS.	High Tide, Philad'a.	Ocean Level.	
Columbia § Table I.	241.3	251.3	
Wrightsville .....	247.5	257.5	
Creitz Creek ¶ .....	263.	273.	
Hellam .....	336	346	
Heistand's .....	327.2	337.2	
York (N. Central R. R.) Tab.	371.7	381.7	

\* Junction with Pennsylvania R. R. at Pomeroy Station, 43 (42.2?) miles west of Philadelphia.

\*\* Crossing the Philadelphia and Baltimore Central R. R.

† Crossing of the Delaware Railway Line.

‡ Crossing of the Philadelphia, Wilmington and Baltimore R. R.

§ Junction with the Columbia Branch of the Pa. R. R.

¶ Bench mark on east end of coping girder of bridge No. 3, over road and Creitz Creek.



*V. Mifflin and Centre Co. R. R.*

The levels of the Mifflin and Centre Co. Railroad were copied from a profile in the office of the Pennsylvania R. R. Co., at Philadelphia, furnished by Mr. W. H. Wilson, Consulting Engineer, Pennsylvania R. R.

The datum is that of the Pennsylvania R. R., 7 feet added, to reduce to mean Atlantic level, in the second column.

STATIONS.	Above Tide.	Ocean Level.
Lewistown Junction*.....	492	499
Logan.....	527	534
Yeagertown.....	561	568
Mann's.....	673	680
Reedsville.....	695	702
Honey Creek.....	807	814
Nagney.....	849	856
Milroy†.....	987	994

*VI. Sunbury and Lewistown R. R.*

NOTE.—No records of this road could be obtained.

*VII. East Broad Top Narrow Gauge R. R.*

The levels on the East Broad Top R. R. (3 foot gauge), were copied from a profile in the office of the Company, at Orbisonia, by permission of Mr. A. W. Sims, Superintendent.

The datum of the profile is an assumed elevation, and has been reduced to tide level by reference to the Pennsylvania R. R. grade at Mount Union, 590', with 7' added to reduce to mean Atlantic Ocean level.

STATIONS.	Assumed Datum.	Ocean Level.
Mount Union Junction †.....	810.65	597
Morrison's Summit.....	828	615
Aughwick Creek.....	773.60	560
Shirleysburg.....	784.94	572
Douglas Summit.....	811.24	598
McMullen's Summit.....	882.74	669
Orbisonia.....	837.62	624
Jordan's Summit.....	922.22	709
Scottsville.....	929.85	717
Saltillo.....	994.70	781
Moreland's Summit.....	1326.90	1114
Sidling Hill.....	1445.47	1232
Cole's Station.....	1572.06	1359
Cook's Mill.....	1741.28	1528
Cook's Station.....	1754.24	1541
Coal Openings.....	1978.10	1765
Robertsdale.....	1998.70	1785
End of Road §.....	2030.02	1817

\* With the Pennsylvania R. R. near the Lewistown Station. Table I.

† Terminus in the Kishicoquillis Valley. This survey has been extended through the Seven Mountains to Bellefonte.

‡ East Broad Top R. R. connects with Pennsylvania R. R. at Mount Union.

§ On the plateau of the Broad Top Mountain in Huntingdon County.

VIII. *Huntingdon and Broad Top R. R.*

The levels on the Huntingdon and Broad Top R. R. and its Branches, were furnished by Mr. John Fulton, General Mining Engineer of the Cambria Iron Works at Johnstown, Pa.

The datum is 0 at grade on the Pennsylvania R. R. at Huntingdon. To this 614' are added, + 7', to reduce all to mean Atlantic Ocean level.

This road has three coal branches up the three streams which drain the Broad Top Coal Region. It originally stopped at Everett; but has been continued to Bedford and Bridgeport under the name of the Bedford and Bridgeport Railroad. Table IX.

The elevations on the Bedford and Bridgeport R. R. were furnished by Mr. S. M. Prevost, Superintendent of the Bedford Division of the Pennsylvania R. R.

The datum 0 of this road was at grade of the Pennsylvania R. R. at Huntingdon; which Mr. Prevost called 610; while Mr. Wilson calls it 614. The difference of 4 feet has therefore, in the 2d column, been added to Mr. Prevost's figures, to make them agree with Mr. Wilson's figures, along the main line. The regular 7 feet addition has also been made in the second column to reduce to mean Atlantic Ocean level.

STATIONS.	Above Hunting- don.	Ocean Level.	
Huntingdon.....	000	621	
McConnellstown.....	56.2	677	
Pleasant Grove.....	127.2	748	
Marklesburg.....	167.6	789	
Coffee Run.....	250.6	872	
Rough and Ready.....	267.6	889	
Cove.....	300	921	
Fisher's Summit.....	253	874	
New Bridge.....	210.3	831	
Saxton (new depot).....	228	849	
Riddlesburg.....	243.6	865	
Hopewell.....	277.3	898	
Piper's Run.....	326.3	947	
Brallier's Summit.....	487.3	1108	
Tatesville.....	475.3	1096	
Bloody Run Summit.....	613.3	1234	
Everett.....	497.3	1118	

IX. *Continued as the Bedford and Bridgeport R. R.*

Mount Dallas.....(above tide)	1046	1053	
Cove Creek.....	1026	1033	
Lutzville.....	1038	1045	
Bedford.....	1055	1062	
Wolfsburg Summit.....	1111	1118	
Napier.....	1101	1108	
Mann's Choice.....	1129	1136	
Buffalo Summit.....	1349	1356	
Fossilville.....	1084	1091	
Bridgeport (a).....	923	930	
Maryland State Line (b).....	837	840	

(a) Not the Bridgeport of Clearfield County in Table XIV.

(b) Continued as Baltimore, Connellsville & Pittsburgh R. R. Branch of the Baltimore and Ohio R. R.

*X. Shoup's Run Branch of H. & B. T. R. R.*

Saxton (as above).....	228	849
Coalmont.....	488.8	1110
Crawford.....	620.9	1242
Old M. P.....	662 7	1284
No. 3. Mine.....	784.5	1405
Barnet Mine.....	767	1388
Dudley Station.....	803.6	1425
Blair's Mine.....	815.2	1436
Moredale.....	1058.7	1680
Water Station.....	1088	1709
End of Track.....	1240.2	1861

*XI. Six Mile Run Branch of H. & B. T. R. R.*

Riddlesburg (as above).....	243.6	865
“ Coal Mine.....	340.9	962
Coaldale. ....	505.2	1126
End of 3d Mile.....	573	1194
End of 4th Mile.....	753	1374
End of Track.....	795	1416

*XII. Sandy Run Branch of H. & B. T. R. R.*

Hopewell (as above).....	277.3	898
End of Track.....	404	1025

*XIII. Lewisburg, Centre and Spruce Creek R. R.*

NOTE.—The levels on the Lewisburg Centre and Spruce Creek R. R. were furnished by Mr. George W. Leuffer, Chief Engineer. Mr. Leuffer says, “I will remark that many of the Stations have, as yet, not been located. The tide levels are based upon a level furnished by A. B. Starr, Esq., Engineer of P. & E. R. R., of a point in abutment of Chilesquaque Bridge (of P. & E. R. R.), and this agrees so closely with the level of tide, as stated in printed table of Pennsylvania R. R. Co , of Tyrone City, that I am inclined to rely upon the levels I now enclose.”

The first column, then, gives the figures of Mr. Leuffer.

The second column has 7 feet added to Mr. Leuffer's figures, on the supposition that his datum is Pennsylvania R. R. datum of high water at the Schuylkill Bridge.

The third column has 8 feet added (in addition, = 15 feet in all) to agree with the final mean Atlantic Ocean level assigned to Tyrone, in the Pennsylvania R. R. list, No. I.

STATIONS.	Above Tide.*	Ocean Level.†	Ocean Level.‡
P. & E. R.R. Junction ( <i>a</i> )	447	454	462
Lewisburg.....	451	458	466
Biehl. . . . .	503	510	518
Vicksburg.....	514	521	529
Mifflinburg.....	550	557	565
Millmont.....	570	577	585
Laurelton.....	592	599	607
Tunnel ( <i>b</i> ).....	944	951	959
Fowler's.....	976	983	991
Beaver Dam Tunnel....	999	1006	1014
Caburn ( <i>c</i> ).....	1011	1018	1026
Buchannon ( <i>d</i> ).....	1044	1051	1059
Duncan.....	1063	1070	1078
Centre Hall.....	1257	1264	1272
Summit ( <i>e</i> ).....	1275	1282	1290
Lemont ( <i>f</i> ).....	987	994	1002
Kelly ( <i>g</i> ).....	1096	1103	1111
Pinegrove.....	1221	1228	1236
Shugarts.....	1116	1123	1131
Lyon (Penna. Furnace).	1059	1066	1074
Guyer ( <i>h</i> ).....	1129	1136	1144
Lowrie ( <i>i</i> ).....	1094	1101	1109
Miller ( <i>j</i> ).....	1055	1062	1070
Tyrone ( <i>k</i> ) .....(I)	892	899	907

#### XIV. Tyrone and Clearfield R. R.

The elevations on the Tyrone and Clearfield R. R. were copied from a profile in the office of the Pennsylvania R. R. Co. in Philadelphia. The datum is a point 60' below Tyrone, or as it appears on the profile elevation at Tyrone + 840'. Mr. W. H. Wilson is authority for adding 60' to each elevation as shown on the profile.

In the second column seven feet are added to reduce to mean Atlantic Ocean Level.

\* High tide, Schuylkill River, at Philadelphia?

† Calculated from the Lewisburg end.

‡ Adjusted to the Pennsylvania R. R. record at the Tyrone end.

(*a*) Junction with Philadelphia and Erie R. R.

(*b*) Through Paddy's Mountain.

(*c*) Forks of Penn's Creek.

(*d*) Mouth of Muddy Run.

(*e*) Summit of Penn's Valley, Head of Penn's Creek, and Head of Spring Creek, which enters Bald Eagle Creek after passing Bellefonte.

(*f*) End of Nittany Mountain.

(*g*) State Agricultural College.

(*h*) Half Moon Gap.

(*i*) At Warrior's Mark.

(*j*) Logan's Run.

(*k*) L. C. & Sp. Cr. R. R. here connects with the Pennsylvania R. R.

STATIONS.	Above Tide.	Ocean Level.
Tyrone (Pennsylvania R. R.)..(I)	900	907
Bald Eagle R. R. Junction.....	977	984
Vanscoyoc.....	1410	1417
Gardners.....	1561	1568
Mt. Pleasant.....	1767	1774
Emigh's Summit ( <i>a</i> ).....	2033	2040
Sandy Ridge.....	1915	1922
Powelton.....	1791	1798
Osceola Branch R. R.....	1481	1488
Dunbar.....	1446	1453
Moshannon Creek.....	1443	1450
Steiner's Mill.....	1421	1428
Philipsburg.....	1415	1422
Blue Ball.....	1513	1520
Shimmels.....	1634	1641
Wallacetown.....	1675	1682
Turner's Summit.....	1735	1742
Moravian Run.....	1731	1738
Ross' Summit.....	1744	1751
Smael's Summit.....	1709	1716
Camp Hummel.....	1743	1750
Bigler.....	1655	1662
Woodland.....	1465	1472
Roaring Run.....	1420	1427
Leonard's Point.....	1299	1306
Clearfield Creek.....	1133	1140
Sharon's Run.....	1105	1112
Liberty Spring.....	1096	1103
Clearfield.....	1096	1103
Goodfellow's Bridge.....	1103	1110
Spackman's Bluff.....	1110	1117
Susquehanna River.....	1117	1124
Hog Back.....	1119	1126
Hartshorn's Run.....	1125	1132
Curwensville.....	1134	1141
Anderson's Creek ( <i>b</i> ).....	1144	1151
Anderson's Creek ( <i>c</i> ).....	1159	1166
Bridgeport ( <i>d</i> ).....	1183	1190

#### XV. Bald Eagle Valley R. R.

The elevations on the Bald Eagle Valley R. R. were copied from a profile in the office of the Pennsylvania R. R. Company, at Philadelphia. The datum is the same as that of the P. R. R.

In the second column seven feet are added to reduce to mean Atlantic Ocean Level.

(*a*) Allegheny Mountain Summit.

(*b*) First Crossing.

(*c*) Second Crossing.

(*d*) Not the Bridgeport of Bedford County in Table IX.



STATIONS.	Above Tide.	Ocean Level.
Tyrone (as above).....	900	907
Spring Run.....	888	895
Dallas Street.....	921	928
Sinking Run.....	923	930
Little B. E. Creek.....	940	947
Bald Eagle.....	1051	1058
L. B. E. Bridge.....	1065	1072
Summit.....	1103	1110
Hannah.....	1050	1057
Port Matilda (a).....	1000	1007
B. E. Creek Bridge.....	917	924
Martha.....	905	912
Julian.....	844	851
Dick's Run.....	794	801
Unionville.....	775	782
Snow Shoe R. R..... (XVI)	715	722
Milesburg..... (XVII)	693	700
Bald Eagle Canal.....	664	671
Holters'.....	644	651
Mount Eagle.....	655	662
Bald Eagle Plank Road.....	658	665
Howard.....	672	679
Eagleville.....	628	635
Beach Creek.....	607	614
Mill Hall.....	566	573
Lock Haven Junction (b).....	548	555

(a) Main Street.

(b) Junction with the Philadelphia and Erie R. R.

#### XVI. Bellefonte and Snow Shoe R. R.

The levels on the Bellefonte and Snow Shoe R. R. were furnished by Mr. I. L. Sommerville, Resident Engineer. The datum is that of the Pennsylvania R. R.

In the second column seven feet are added to reduce to mean Atlantic Ocean Level.

STATIONS.	Above Tide.	Ocean Level.
Bellefonte..... (XVII)	737	744
Bald Eagle R. R. Junction.. (XV)	715	722
Gum Stump.....	1013	1020
Summit (a).....	1728	1735
Beach Creek (b).....	1542	1549
Beach Creek (c).....	1592	1599
Snow Shoe.....	1565	1572
Middle Coal bed (d).....	1599	1606

(a) Allegheny Mountain summit.

(b) Level of water in Beach Creek.

(c) Level of rail over the water.

(d) Middle coal bed at the Company's mines at Coal Hill.

*XVII. Bellefonte Branch.*

The levels on the Bellefonte Branch were copied from a profile in the office of the Pennsylvania R. R. Company, at Philadelphia, and have the datum of the P. R. R. to which are added seven feet to reduce to mean Atlantic Ocean Level, in the second column.

STATIONS.	Above Tide.	Ocean Level.
Milesburg (a).....(XV)	693	700
B. E. V. Plank Road.....	692	699
Bellefonte.....(XVI)	737	744

*XVIII. Bell's Gap (N. G.) R. R.*

The elevations on the Bell's Gap Narrow Gauge R. R. (3 feet) were furnished by Mr. Jos. Ramsey, Jr., Superintendent.

The datum for the first column is 0 at Pennsylvania R. R. grade at Bell's Mills Station. To which are added 1053' from Table I for the second column, and 7' for the third column, to reduce to mean Atlantic Ocean Level.

STATIONS.	Bell's Mills.†	Corrected Tide.	Ocean Level.
Bell's Mills Junction (I).	0	1053	1060
Roots' .....	162	1215	1222
Collier .....	581.6	1635	1642
Point Lookout.....	854.6	1908	1915
Lloyd's Junction (a) ...	1107.4	2160	2167
Lloyd's Station .....	1119.7	2173	2180
Summit (b) .....	1240.5	2294	2301
Five Foot Coal (c).....	—	2116	2123
Figart's .....	1048	2101	2108
Vanscoyoc.....	935	1988	1995
Crees Summit.....	797	1850	1857
Hollen's (d) .....	582	1635	1642
Three Foot Coal.....	—	1667	1674
Five Foot Coal .....	—	1727	1734
Van Ormer's (e).....	352.3	1405	1412
Three Foot Coal.....	—	1475	1482
Fallen Timber .....	362.	1415	1422

(a) Junction with the Bald Eagle Valley R. R.

(a) Elevation of 5 foot coal bed at the mouth of gangway.

(b) Allegheny Mountain. Bench Mark, Summit of Mountain.

(c) Level of the 5 foot coal bed under the Bench Mark.

(d) Elevation at this point of the 3' vein, 1667'; of the 5' vein, 1727'.

(e) Elevation of Water in Clearfield Creek. The elevation of the 3' vein here is 1475.

*XIX. Hollidaysburg Branch P. R. R.*

The levels on the Hollidaysburg Branch of the Pennsylvania R.R. were copied from a profile in the office of the P. R. R. Company, at Philadelphia.

The datum being mean high tide at the Schuylkill Bridge, seven feet are added in the second column to reduce the mean Atlantic Ocean Level.

STATIONS.	Above Tide.	Ocean Level.	
Altoona (Pennsylvania R. R.)..(I)	1172	1179	
Allegheny.....	1145	1152	
Eldorado .....	1086	1093	
Canon's .....	1059	1066	
Duncansville .....	983	990	
Hollidaysburg .....	946	953	
End of Line (a) .....	937	944	

(a) 3400' beyond the station marked Hollidaysburg.

*XX. Williamsburg Branch P. R. R.*

The levels on the Williamsburg Branch, the Morrison's Cove Branch, the Bloomfield Branch, and the Springfield Branch of the Pennsylvania R. R., were copied from profiles in the office of the Pennsylvania R. R. Company, at Philadelphia.

The datum being mean high tide at the Schuylkill Bridge, seven feet are added to reduce to mean Atlantic Ocean Level.

The Williamsburg Branch R. R. has been substituted for the old State Canal, long since vacated, from Frankstown to Williamsburg, and shows the fall of the Juniata River.

STATIONS.	Above Tide.	Ocean Level.	
Graysport (a).....	947	954	
Hollidaysburg .....	935	942	
Brush Run.....	1026	1033	
Juniata River (b) .....	911	918	
Reese Station .....	896	903	
Clapper's Run .....	894	901	
Koofers Run .....	886	893	
Juniata River (c) .....	886	893	
Pike Ponds .....	878	885	
Flowing Spring .....	874	881	
Springfield R.R. Junc. (d) (XXIII)	874	881	
Williamsburg .....	840	847	

(a) Bench Mark on step of ladies' waiting room, Graysport passenger station, 946.60'.

(b) Frankstown or Main Branch of the Juniata River.

(c) Frankstown or Main Branch of the Juniata River.

(d) Springfield Branch.

## XXI. Morrison's Cove Branch P. R. R.

STATIONS.	Above Tide.	Ocean Level.	
Holidaysburg ..... (XIX)	936	943	
Draw Bridge .....	935	942	
Juniata River ( <i>e</i> ) .....	935	942	
Reservoir .....	960	967	
Catfish .....	961	968	
Riddle's Lane .....	966	973	
Brooks Mill .....	999	1006	
McKee's Gap ( <i>f</i> ) .....	1029	1036	
Martha Furnace .....	1047	1054	
Hammond's .....	1126	1133	
Roaring Spring Junction.. (XXII)	1199	1206	
Erb's Summit .....	1347	1354	
Martinsburg Junction .....	1337	1344	
<i>Martinsburg</i> .....	1359	1366	
Henrietta Junction.....	1384	1391	
Mathew's Summit .....	1465	1472	
Nicodemus' Summit .....	1425	1432	
Clover Creek .....	1385	1392	
Henrietta Ore Bank .....	1402	1409	
End of Road ( <i>g</i> ).....	1415	1422	

## XXII. Bloomfield Branch P. R. R.

STATIONS.	Above Tide.	Ocean Level.	
Roaring Spring ( <i>h</i> )..... (XXI)	1196	1203	
Trestle, No. 1 .....	1214	1221	
Trestle, No. 2.....	1351	1358	
Bloomfield ( <i>i</i> ) .....	1453	1460	

## XXIII. Springfield Branch P. R. R.

STATIONS.	Above Tide.	Ocean Level.	
Williamsburg R. R. Junc.... (XX)	874	881	
Trestle, No. 1.....	961	968	
Goods.....	999	1006	
Davis Summit .....	1372	1379	
8th Mile Post ( <i>j</i> ).....	1367	1374	

(*e*) Frankstown Branch of the Juniata River.

(*f*) Through Dunning's Mountain.

(*g*) In Leather Cracker Cove, the southern end of Morrison's Cove.

(*h*) Junction of this branch with Morrison's Cove Branch R. R. XXI.

(*i*) Iron Mines and Furnaces.

(*j*) This R. R. ascends from the Juniata River to the Springfield Ore Mines in Canoe Valley, the northeast prolongation of Morrison's Cove.

XXIV. *Ebensburg and Cresson R. R.*

The elevations on the Ebensburg and Cresson Railroad were copied from a profile in the office of the Pennsylvania R. R. Company, in Philadelphia.

The datum is mean high water at the Schuylkill Bridge, to which are added seven feet to reduce to mean Atlantic Ocean Level.

STATIONS.	Above Tide.	Ocean Level.	
Cresson R. R. Junction (a)....(I)	2021	2028	
Plank Road Crossing.....	2032	2039	
Lilly .....	2023	2030	
O'Harra.....	2008	2015	
Durbin .....	1920	1927	
Sander's.....	2012	2019	
Bradley's .....	2111	2118	
Dam (b).....	1953	1960	

(a) The Junction with Pa. R. R. is not at Cresson 2010' (2017') but near Cresson 2021' (2028).

(b) This is the last point on the profile where the elevation is given.

XXV. *Blairsville and Indiana Branch P. R. R.*

The elevations on the Blairsville and Indiana Branch of the Pennsylvania R. R. were taken from a profile in the office of the P. R. R. Company, at Philadelphia.

The datum is high tide Schuylkill River, at the Philadelphia Market Street Bridge. To this seven feet are added in the second column to reduce to mean Atlantic Ocean Level.

STATIONS.	Above Tide.	Ocean Level.	
R. R. Junction (a).....(I)	1104	1111	
Pennsylvania Canal .....	958	965	
R. R. Junction (b).....	970	977	
Blairsville (c) .....	1004	1011	
Smith's Summit.....	1096	1103	
Wier's Run .....	963	970	
Black Lick .....	956	963	
Water Station .....	959	966	
Black Lick Bridge.....	1075	1082	
Doty's Bridge .....	1004	1011	
Rough's.....	1021	1028	
Saw Mill Run.....	1009	1016	
Bell's Mill's Run.....	1025	1032	
Phillips' Summit.....	1037	1044	
Kissinger's Summit .....	1048	1055	
Two Lick Creek .....	1037	1044	
Reed's .....	1138	1145	
Indiana Terminus.....	1304	1311	

(a) With the Main line Pennsylvania R. R. on the side of Chestnut Ridge, high above the bed of the river.

(b) With the Indiana and Blairsville Branch

(c) Market Street Station, in Blairsville.



XXVI. *West Penn R. R.*

The levels of the West Penn R. R. were copied from a profile in the office of the Pennsylvania R. R. Company, at Philadelphia.

The datum is mean high tide in the Schuylkill River, at Philadelphia. In the second column seven feet are added to reduce to mean Atlantic Ocean Level.

This Railroad follows down the valley of the Kishkimitas from Blairsville to Freeport, sometimes using the bed of the old State Canal.

STATIONS.	Above Tide.	Ocean Level.
Blairsville ( <i>a</i> ).....XXV	1004	1011
Livermore.....	938	945
Saltzburg ( <i>b</i> ).....	884	891
Fairbank's ( <i>c</i> ).....XXVII	926	933
Helma.....	1010	1017
Salina.....	948	955
North West.....	887	894
Roaring Run.....	823	830
Apollo.....	816	823
Townsend's Summit.....	880	887
Grinder's.....	820	827
Hill's Mill.....	773	780
A. V. R. R. Crossing ( <i>d</i> ).....	778	785
Freeport ( <i>e</i> ).....XXVIII	763	770
Sligo.....	768	775
Karn's.....	761	768
Natrona.....	761	768
Tarentum.....	750	757
Bailey's Run.....	746	753
Springdale.....	742	749
Harmersville.....	736	743
Fairview.....	734	741
Ross.....	738	745
Sharpsburg ( <i>f</i> ).....	732	739
Bennett's.....	734	741
Duquesne Borough.....	734	741
Allegheny City ( <i>g</i> ).....	736	743
Allegheny City ( <i>h</i> ).....	738	745
Allegheny City ( <i>i</i> ).....	736	743
Terminus ( <i>j</i> ).....	734	741

(*a*) Market Street Station, Blairsville.

(*b*) Market Street, Saltzburg.

(*c*) Coal R. R. here connects, see next table XXVII.

(*d*) Crossing Allegheny Valley R. R.

(*e*) Second Street, Freeport.

(*f*) Main Street, Sharpsburg.

(*g*) Sycamore Street, Allegheny City.

(*h*) Chestnut Street, Allegheny City.

(*i*) East Lane, Allegheny City.

(*j*) Opposite Pittsburgh and connecting with the Pittsburgh, Fort Wayne and Chicago R. R. lines.

## XXVII. Branch of W. P. R. R.

The levels on the Branch of the West Penn Railroad from Fairbank's Station to the Coal Mines were furnished by Mr. George W. Leuffer, C. E. The datum 0 is at grade of W. P. R. R., Fairbank's Station.

STATIONS.	Above Tide.	Ocean Level.	
Fairbank's Junction.....XXVI	926	933	
Grade near Mines.....	1111	1118	
Bottom of Coal Bed.....	1133	1140	

## XXVIII. Butler Branch W. P. R. R.

The levels on the Butler Branch Extension of the West Penn R. R. were furnished by Mr. Antes Snyder, Engineer, Springdale, Allegheny County, Pa.

There is an *unexplained difference* of 29.5 feet between the Butler Branch R. R. grade and the West Penn R. R. grade at Freeport, where they ought to be the same.

Another list was obtained from Mr. J. M. C. Creighton, differing very slightly from Mr. Snyder's; but still leaving an *unexplained difference* of 27 feet at Freeport.

The second column in the first table gives Mr. Snyder's levels *let down* 29½ feet, and in the second table Mr. Creighton's levels let down 27 feet.

The third column has seven feet added to reduce to mean Atlantic Ocean Level.

The datum of both tables is called "Mid Tide" at Philadelphia, which would require an addition of only 3.349 feet (instead of 7) to his original figures. See foot note on page 64. But this "Mid-Tide" may be a mistake for the "Mean High Tide" of the Pennsylvania R. R. Company's datum and is so taken.

STATIONS.	Mid Tide Philada.	2d Column.	Ocean Level.	
Freeport Junc....XXVI	792.5†	763‡	770	
Buffalo .....	792.5	763	770	
Monroe.....	865.5	836	843	
Sarver's.....	1056	1026.5	1034.5	
Saxon.....	1254.5	1225	1232	
Delano .....	1255.5	1226	1233	
Dilke's.....	1335	1305.5	1313.5	
Summit    .....	1344.5	1315	1322	
Great Belt City.....	1286.5	1257	1264	
Summit §.....	1328	1298.5	1306.5	
Herman.....	1323.5	1394	1301	
Bunker's .....	1285.5	1256	1263	
Butler.....A	1031.5	1002	1009	

† Levels furnished by Mr. Antes Snyder.

‡ Elevation on profile of West Penn R. R. at Freeport.

|| West of Dilke's.

§ East of Herman.

STATIONS.	Mid Tide Philada.	2d Column.	Ocean Level.	
Freeport Junc....XXVI	790 †	763 ‡	770	
Buffalo .....	788	761	768	
Harbison.....	824	797	804	
Monroe.....	863	835	842	
Sarver's.....	1052	1025	1032	
Saxonberg.....	1227	1200	1207	
Delano .....	1252	1225	1232	
Dilke's.....	1337	1310	1317	
Great Belt.....	1285	1258	1265	
Herman.....	1318.50	1291	1298	
Bunker.....	1288.38	1261	1268	
Butler.....B	1030	1003	1010	

### XXIX. Ligonier Valley R. R.

The levels on the Ligonier Valley R. R. were copied from notes in possession of Mr. George L. Miller, C. E., Pittsburgh, Pa. The datum is Pennsylvania R. R. at Latrobe. To which add 1144 for high tide at Philadelphia.

STATIONS.	Above Tide.	Ocean Level.	
Ligonier.....	1144	1151	
Mill Creek.....(Surface of water)	1131	1138	
Coal Pit Run.....	1132	1139	
Schriner's Run.....	1127	1134	
Turnpike Crossing (a).....	1123	1130	
Butler Milk Falls (b).....	1123	1130	
Baker's Saw Mills (c).....	1117	1124	
Little Rock Hollow.....	1096	1103	
Big Rock Hollow.....	1080	1107	
Kellog's Hollow.....	1068	1075	
Iron Ore (d).....	1040	1047	
Johnson's Forge.....	1036	1043	
Derry Road Crossing.....	1030	1037	
Mitchell's Run (e).....	1029	1036	

### XXX. S. W. Pennsylvania R. R.

The levels of the South West Pennsylvania R. R. were furnished by Mr. G. W. Leuffer, Engineer.

The datum or base of levels is ordinary High Tide at Philadelphia.

† Elevations furnished by Mr. J. M. C. Creighton, Superintendent, West Penn. Division, Pennsylvania R. R.

‡ Elevation on profile of West Penn R. R. at Freeport.

(a) Greensburg and Stoystown.

(b) Loyalhanna Creek.

(c) At a point opposite Baker's Saw Mills.

(d) Out-crop of iron ore on line of R. R. 7 miles from Ligonier and 3 miles from Latrobe.

(e) Near Latrobe on the Pennsylvania R. R. Table I.

STATIONS.	Above Tide.	Ocean Level.
Greensburg Junction (a).....I	1093	1100
East Greensburg.....	1055	1062
Huffs.....	994	1001
County Home.....	972	979
Fosterville.....	960	967
Youngwood.....	950	957
Jack's Run.....	947	954
Paintersville.....	945	952
Sewickley Creek.....	936	943
Hunker's.....	938	945
Bethany.....	1044	1051
Tarr's.....	1092	1099
Stoner's Summit.....	1138	1145
Hawk Eye.....	1060	1067
Scottdale.....	1035	1042
Jacob's Creek.....	1027	1034
Everson.....	1027	1034
Valley Works.....	1068	1075
Pennsville Summit.....	1086	1093
Pennsville.....	1047	1054
Davidson.....	891	898
Connellsville.....	908	915

(a) Junction with Pennsylvania R. R. near Greensburg.

### XXXI. Yohioghenny R. R.

The elevations on the Yohioghenny R. R. were copied from notes in the possession of Mr. John F. Wolf, Engineer Pennsylvania Gas Coal Co., Irwin's Station, Westmoreland County, Pa.

The datum is Pennsylvania R. R. at :

STATIONS.	Above Tide.	Ocean Level.
Irwin's Stat. P. R. R. (a).....I	877	884
Shaft No. 2.....	986	993
Tunnel.....	1104	1111
Chamber's.....	1075	1082
McGrew's.....	974	981
Millgrove ..	926	933
Little Sewickley (b).....	797	804
Marchand's (c).....	763	770
Yohioghenny (d).....	776	783
Sewickley Station (e).....	773	780
R. R. Junction (f).....	761	768

(a) Junction with Pennsylvania R. R. at Irwin's Station.

(b) First Crossing Little Sewickley Creek.

(c) Yohioghenny Mine, No. 1, Shaft No. 3, elevation of Coal, 720'.4 above Tide.

(d) Yohioghenny Mine, No. 2, elevation of Coal 776'.4 above Tide.

(e) Mine No. 4, elevation of Coal opening at this point 800'.4 above Tide.

(f) Junction with Pittsburgh and Connellsville R. R.

## II. READING SERIES.

*L. Philadelphia and Reading R. R.*

The elevations at the following points on the Philadelphia and Reading Railroad and Branches, were furnished by Mr. Wm. Lorenz, Chief Engineer.

The number of stations given in the tables, are few, but no others could be obtained.

The datum is *mid tide* at Philadelphia.

To this must be added 3.349 feet to reduce to Atlantic Ocean Level.

STATIONS.	Mean Tide.	Ocean Level.	
Philadelphia ( <i>a</i> ) .....			
Nicetown Summit ( <i>b</i> ).....LI	111	114	
Belmont .....			
West Falls.....			
Pencoyd .....			
West Manayunk.....			
Mill Creek.....			
West Spring Mill .....			
West Conshohocken.....			
Swede Furnace .....			
Bridgeport ( <i>c</i> ).....LII			
Merion.....			
Port Kennedy ( <i>c</i> ).....LII			
Valley Forge .....			
Perkiomen Junction ( <i>d</i> ).....LIV			
Phoenixville ( <i>e</i> ).....LIII	105	108	
Mingo .....			
Royer's Ford.....			
Limerick .....			
Pottstown ( <i>f</i> ).....LV	146	149	
Douglassville .....			
Monocacy .....			
Birdsboro ( <i>g</i> ).....	170	173	
Exeter .....			
Neversink.....			
Reading ( <i>h</i> )...LVI, LVII, LVIII, LIX.....	264	267	
Tuckerton.....			
Leesport.....	292	297	
Mohrsville .....			
Shoemakersville .....			
Hamburg.....	361	364	
Port Clinton ( <i>i</i> ).....LXII	397	400	
Auburn ( <i>j</i> ).....LXIII	457	460	
Landingville.....			
Schuylkill Haven ( <i>k</i> ).....( )	520	523	
Mount Carbon.....	591	594	
Pottsville ( <i>l</i> ).....LXVI	603	606	

*a* Richmond Street Bridge, near the Coal Depots on the Delaware River.

*b* In Philadelphia, near the Germantown Road. The Germantown R. R.



*LI. Germantown and Norristown Branch P. & R. R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Philadelphia ( <i>a</i> ).....I	39	42	
Nicetown ( <i>b</i> ).....	132	135	
Columbia Avenue.....See below			
New York Junction.....			
Tioga.....			
Wayne.....			
Fisher's.....			
Duey's (or Wistar Street).....			
Shoemaker's.....			
Church Lane.....			
Germantown Depot ( <i>m</i> ).....	212	215	
Chestnut Hill.....	404	407	
Philadelphia.....			
Columbia Avenue.....See above	39	42	
New York Junction.....			
East Falls.....			
School Lane.....			
Wissahickon.....			
Schur's.....			
Manayunk.....			
Springfield.....			
Shawmont.....			
Princeton.....			
Lafayette.....			
Spring Mill.....			
Conshohocken.....			
Potts Landing.....			
Magee's.....			
Norristown ( <i>n</i> ).....CIII	62	65	

crosses the P. & R. R. R. in Nicetown on a bridge at an elevation of 132 (135) feet; but not at this summit. Table LI.

*c* Norristown opposite Bridgeport is given in this list as 62 (65.) See Table LI. Bridgeport is at the Junction of the Chester Valley R. R. See Table LII. R. R. to King of Prussia; no levels furnished.

*d* Perkiomen R. R.

*e* Pickering Valley R. R.

*f* Colebrookdale R. R.

*g* Wilmington and Reading R. R.

*h* Lebanon Valley R. R. Reading and Columbia R. R. East Penn R. R.

*i* Little Schuylkill R. R.

*j* Schuylkill and Susquehanna R. R.

*k* West Branch R. R.

*l* Mill Creek R. R. Schuylkill Valley R. R.

*a* Depot at the corner of 9th and Green Streets.

*b* Crosses the P. & R. R. R. on a bridge, but not at the Nicetown Summit mentioned in Table L.

*m* Probably the old Depot.

*n* The N. Penn. R. R. level, Stony Creek branch, is 50 (62 Ocean level).

*LII. Chester Valley Railroad*

The levels on the Chester Valley Railroad, were furnished by Mr. W. H. Holstein, Secretary of the Chester Valley Railroad Company.

The road connects with the Philadelphia and Reading Railroad at Bridgeport, and with the Pennsylvania R. R. at Downingtown.

The base of the levels is *mid tide* at Philadelphia. Add 3.349 to reduce to Ocean level.

STATIONS.	Mean Tide.	Ocean Level.
Bridgeport ( <i>a</i> ).....L	73	76
Shainlines.....	133	136
Henderson's.....	162	165
King of Prussia.....	187	190
Centreville.....	199	202
Gardens.....	222	225
Howellville.....	218	221
Paoli Road.....	235	238
Cedar Hollow.....	243	246
Lee's.....	276	279
Valley Store.....	292	295
Mill Lane.....	312	315
White Horse.....	336	339
Exton.....	321	324
Oakland.....	298	301
Baldwin's.....	296	299
Downingtown ( <i>b</i> ).....I	264	267

*LIII. Pickering Valley R. R.*

Of this line only one level was furnished.

Datum (Reading R. R.) mean tide at Philadelphia. Add 3.349 for Ocean level.

STATIONS.	Mean Tide.	Ocean Level.
Phoenixville.....L	(105)	(108)
French Creek.....		
Kimberton.....		
Pikeland.....		
Chester Springs.....		
Cambria.....		
Byer's Eagle Summit.....	450	453

*a* Opposite Norristown, Table L.

*b* On the Pennsylvania R. R.

*LIV. Perkiomen R. R.*

STATIONS.	Mean Tide.		
Perkiomen Junction ( <i>a</i> ).....L			
Oaks.....			
Doe Run.....			
Yerke's.....			
Collegeville....	151	154	
Rahn's.....			
Grater's Ford.....			
Skippack.....			
Schwenksville.....	149	152	
Green Land.....	245	248	
Emaus Junction ( <i>b</i> ).....LXI			

*a* Reading R. R.*b* East Penn R. R.*LV. Colebrookdale R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Pottstown ( <i>a</i> ).....L	(146)	(149)	
Glasgow.....			
Manatawny.....			
Iron Stone.....			
Colebrookdale.....			
Boyertown.....	388	391	
New Berlin.....			
Bechtelsville.....			
Mt. Pleasant.....	466	469	
Rittenhouse Gap.....			
Alburtis ( <i>b</i> ).....LXI	(427)	(430)	

*a* Reading R. R.*b* East Penn R. R.*LVI. Wilmington and Reading R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Reading.....L	(264)	(267)	
Birdsboro ( <i>a</i> ).....L	(170)	(173)	
Springfield.....			
Coatesville ( <i>b</i> ).....I			
Chadd's Ford ( <i>c</i> ).....			
Wilmington ( <i>d</i> ).....			

*a* Junction with Philadelphia and Reading R. R.*b* Crosses Pennsylvania R. R.*c* Crosses Philadelphia and Baltimore R. R.*d* Connects with Philadelphia, Wilmington and Baltimore R. R.

*LVI. Wilmington and Reading R. R.*

These levels of the Wilmington and Reading R. R. were furnished by Mr. E. Collings, Superintendent.

The datum, or base of levels, is low tide at Wilmington, Del. Relation of Ocean Level to this datum is unknown.

STATIONS.	Low Tide.	Ocean Level.
Birdsboro Junction ( <i>a</i> ).....L	173	(173)
Hampton.....	223	
White Bear.....	349	
Geigertown.....	432	
Cold Run.....	525	
Joanna.....	627	
Springfield.....	645	
Conestoga.....	647	
Isabella.....	639	
E. B. & W. R. R. Crossing ( <i>b</i> )..II	647	
Beaver.....	603	
Honeybrook.....	596	
Manor.....	572	
Hibernia.....	530	
Brandywine.....	556	
Coatesville ( <i>c</i> ).....I	315.	
Modena.....	278	
Mortonville.....	260	
Laurel.....	241	
Embréville.....	231	
Glen Hall.....	218	
Northbrook.....	209	
Seeds.....	195	
Lenape.....	183	
Pecopson.....	180	
Chadd's Ford.....	175	
Smith Bridge.....	209	
Centre.....	263	
Dupont's.....	282	
Wilmington.....	12	(12)

*a* Junction with Philadelphia and Reading R. R. at Birdsboro, Berks County, Pennsylvania.

*b* Junction with E. Brandywine and Waynesburg R. R., Chester County, Pa.

*c* The Pennsylvania R. R. track on bridge just west of Coatesville Station is 62' higher than track on W. & R. R. R. The elevation on Pennsylvania R. R. at the point where it crosses the W. & R. R. R. is 374' above tide. By deducting 62' according to Pennsylvania R. R. datum the elevation would be 312'. The datum of the Pennsylvania R. R. is high tide in Schuylkill River. The datum of W. & R. R. R. is low tide at Wilmington.

*LVII. Lebanon Valley R. R.*

STATIONS.	Mean Tide.	Ocean Level.
Reading ( <i>a</i> ).....L	(264)	(267)
Schuylkill Bridge.....	262	265
Sinking Springs ( <i>b</i> ).....LVIII	(341)	(344)
Wernersville.....	376	379
Heidelberg.....	376	379
Robesonia.....	428	431
Sand Holes Summit.....	450	453
Womelsdorf.....	433	436
Smiths'.....	425	428
Missimer's.....	425	428
Richland.....	420	423
Myerstown.....	460	463
Prescott.....	503	506
Avon.....	467	470
Lebanon.....	456	459
C. R. R. Junction ( <i>c</i> ).....LX	444	447
L. & T. R. R. Junction ( <i>d</i> )...LIX	439	442
Annville.....	436	439
Palmyra.....	443	446
Spring Creek.....	384	387
Hummelstown.....	360	363
Swatara Creek.....	355	358
Swatara Hills Summit.....	428	431
Rutherford's.....	425	428
Paxton.....	363	366
Harrisburg ( <i>e</i> ).....I	308	311

*a* Reading R. R.*b* Reading and Columbia R. R.*c* Cornwall R. R. Junction.*d* Lebanon and Tremont R. R. Junction.*e* West Line of Lebanon Valley Depot, Harrisburg, which, however, according to Pennsylvania R. R. Table I, is 315.5; probably more correct than 308.*LVIII. Reading and Columbia R. R.*

STATIONS.	Above Tide.	Ocean Level.
Reading.....L	(264)	(267)
Sinking Springs ( <i>a</i> ).....LVII	341	344
Deep Cut ( <i>b</i> ).....	566	569
Fitztown.....		
Reinhold's.....		
Union.....		
Ephrata.....	378	381

*a* Junction with the Lebanon Valley Road.*b* South Mountain Summit.



## LVIII. Reading and Columbia R. R.—CONTINUED.

STATIONS.	Above Tide.	Ocean Level.	
Rothville Summit (c).....	401	404	
Litiz.....			
Manheim.....			
Sellers.....			
Lancaster Junction.....			
Landisville (d).....I	397	400	
Bruckhart's.....			
Ironville.....			
Kauffman's.....			
Chestnut Hill Summit.....	582	585	
Columbia (e).....I	257	260	

c This summit comes in *somewhere* between Ephrata and Landisville.

d Crosses Pennsylvania R. R. *on grade*. It is given as 398 (405) in Table I, — a difference in the *Ocean Level* column of (5) feet.

e The Pennsylvania *Ocean Level* grade here is (251) at the depot on the street, lower down on the hill slope.

## LIX. Lebanon and Tremont R. R.

STATIONS.	Mean Tide.	Ocean Level.	
Lebanon Junction (a).....LVII	(439)	(442)	
Heilmansdale.....	505	508	
Bunker Hill.....			
Jonestown.....			
Union Forge.....			
Swatara Gap.....			
Murray.....			
Mifflin.....			
Irving.....			
S. & S. R. R. Junc. (b)....LXIII	491	494	
Pinegrove.....			
L. G. Ex. R. R. Junc. (c)....(..)			
Tremont (R. R. Junc.) (d)....(..)			
Donaldson.....	901	904	
Kalmia Colliery.....	1128	1131	

## LX. Cornwall R. R.

NOTE.—The levels on the Cornwall Railroad were copied from a profile furnished by Mr. A. Wilhelm, President of the Company.

Reading R. R. datum, Mean Tide at Philadelphia. Add 3.349 feet for ocean level.

Lines have been surveyed south to Mount Hope, and to Manheim.

a Lebanon Valley R. R.

b Schuylkill and Susquehanna R. R.

c Lorberrry Gap Extension R. R.

d Mine Hill R. R.; Lyken's Valley R. R.

STATIONS.	Mean Tide.	Ocean Level.	
Lebanon Junction ( <i>a</i> ).....LVII	444	447	
Cumberland Street.....	425	428	
Plank Road.....	438	441	
Killian's Road.....	534	537	
Coleman's Road.....	534	537	
Furnace Run.....	539	543	
Cornwall ( <i>b</i> ).....	576	579	

*a* Junction with Lebanon Valley R. R. near Lebanon.

*b* Opposite the Middle of the Ore Hill.

*LXI. East Penn R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Reading ( <i>a</i> ).....L	(264)	(267)	
Temple .....			
Blandon .....	405	408	
Fleetwood.....			
Lyons.....	460	463	
Bower's.....			
Topton Junction ( <i>b</i> ).....	471	474	
Mertztown.....			
Shamrock.....			
Alburtis Intersection ( <i>c</i> ).....LV	427	430	
Millerstown .....			
Emaus Station ( <i>d</i> ).....LIV	417	420	
Penn Junction ( <i>e</i> ).....	260	263	
Allentown.....			

*a* Reading R. R.

*b* Branch R. R. to Kutztown.

*c* Fogelsville R. R.—Colebrookdale R. R.

*d* Perkiomen R. R.

*e* Lehigh Valley R. R., just below Allentown, where the 260 (263) elevation is supposed to apply.

*LXII. Little Schuylkill R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Port Clinton ( <i>a</i> ).....L	(397)	(400)	
Drehersville.....			
Ringgold.....	541	544	
Hecla.....			
Reynolds.....			
Tamaqua ( <i>b</i> ).....	787	790	

*a* Reading R. R.

*b* South side of Broad Street.—Mountain Link and Schuylkill Valley R. R.—East Mahanoy R. R.

*LXIII. Schuylkill and Susquehanna R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Auburn Junction ( <i>a</i> ).....L	(457)	(460)	
Jefferson.....			
Summit.....			
White Horse.....			
Stanhope.....			
Pinegrove Junction.....	511	514	
L. & P. R. R. Junction ( <i>b</i> )..LIX	(491)	(494)	
Ellwood.....			
Gold Mine.....			
Rausch Gap.....			
Cold Spring.....			
Yellow Spring.....			
Rattling Run.....			
Forge.....			
Dauphin ( <i>c</i> ).....			
Rockville ( <i>d</i> ).....I	(343)	(350)	

*a* Reading R. R.

*b* Lebanon and Pinegrove R. R., or Lebanon and Tremont.

*c* East side of the Susquehanna River.

*d* East side of Susquehanna River, crossing Pennsylvania R. R. at grade, at the east end of the long bridge, 5 miles above Harrisburg.

*LXIV. Mine Hill and Schuylkill Haven R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Schuylkill Haven ( <i>a</i> ).....L	(520)	(523)	
Westwood Junction.....	654	657	
Summit.....	860	863	
Tremont.....	758	761	
Westwood Junction, as above....	(654)	(657)	
Minersville.....	684	687	
Mine Hill Gap.....	816	819	
Glen Carbon.....	1136	1139	
Head of Mine Hill Plane, No. 1 ..	1519	1522	
Foot of Gordon Plane.....	773	776	
Centralia.....CXV	1465	1468	
Potts Colliery, Locust Dale.....	1095	1098	

*a* Junction with Philadelphia and Reading R. R.

## LXV. Catawissa and Williamsport R. R.

STATIONS.	Mean Tide.	Ocean Level.
Tamaqua ( <i>a</i> ).....LXVIII	(787)	(790)
East Mahanoy Junction ( <i>b</i> ).....	(1093)	(1096)
Tamenend ( <i>c</i> ).....	1291	1294
Quakeake Junction ( <i>d</i> ).....CXV	1350	1353
Summit .....	1542	1545
Girard.....		
Girard Passing.....		
Brandonville.....		
Ringtown .....	1332	1335
Beaver.....		
McAuley .....	759	762
Mainville.....	674	677
D. W. & H. R. R. ( <i>e</i> ).....CXVI	476	479
Catawissa .....	474	477
North Branch ( <i>f</i> ).....	481	484
Rupert ( <i>g</i> ) .....		
Danville.....	493	496
Moorestburg.....		
Pottsgrove.....	494	497
Dougal .....	501	504
Milton.....		
P. & E. R. R. Crossing ( <i>h</i> ) CCXIII	480	483
Datesman's.....		
West Branch ( <i>i</i> ).....	475	478
New Columbia.....		
White Deer.....	486	489
Allenwood.....		
Fritz.....		
Montgomery .....		
P. & E. R. R. Crossing ( <i>j</i> ) CCXIII	500	503
Susquehanna River ( <i>k</i> ).....	505	508
Muncy .....	504	507
Hall's.....	521	524
Montoursville.....	534	537
Loyalsock Creek ( <i>l</i> ) .....	535	538
P. & E. R. R. Crossing ( <i>m</i> ) CCXIII	542	545
Williamsport Depot ( <i>n</i> ).....	530	533

*a b* East Mahanoy R. R.

*c* Junction with Lehigh and Susquehanna Division of Central R. R. of N. J.

*d* With Lehigh Valley R. R.

*e* Crossing Danville, Hazelton and Wilkesbarre R. R. below Catawissa.

*f* Susquehanna River, water 29' below rail.

*g* Junction with Lackawanna and Bloomsburg R. R.

*h* Crossing P. & E. R. R. (Milton).

*i* Susquehanna River, West Branch, water 28' below rail.

*j* Crossing P. & E. R. R. (Montgomery).

*k* Water 30' below rail.

*l* Water 13' below rail.

*m* Crossing P. & E. R. R. (Williamsport).

*n* The level of the Philadelphia and Erie R. R. at this point is given in Table CCXIII, as 510.43 feet above Ocean Level.

*LXVI. Mill Creek R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Pottsville ( <i>a</i> ).....L	(603)	(606)	
Mount Carbon ( <i>a</i> ).....L	(591)	(594)	
Mill Creek Junction.....	622	625	
Port Carbon ( <i>b</i> ).....LXVII	627	630	
Dormer's .....			
St. Clair.....			
Lanigan Furnace.....	706	709	
John's Mines.....	827	830	
New Castle.....	875	878	
Head of Grade.....			
Frackville.....			

*a a* Philadelphia and Reading R. R.

*b* Junction with Schuylkill Valley R. R.

*LXVII. Schuylkill Valley R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Pottsville ( <i>a</i> ).....L			
Mt. Carbon ( <i>a</i> ).....L			
Port Carbon ( <i>b</i> ).....LXVI			
Eagle Hill.....			
Cumbola.....			
New Philadelphia .....			
Middleport.....	712	715	
Brockville.....			
Tuscarora.....	895	898	
Newkirk.....			
Tamaqua ( <i>c</i> ).....LXII	(787)	(790)	

*a a* Philadelphia and Reading R. R.

*b* Junction with Mill Creek R. R.

*c* Junction with Little Schuylkill R. R.

*LXVIII. East Mahanoy R. R.*

STATIONS.	Mean Tide.	Ocean Level.	
Tamaqua ( <i>a</i> ).....LXII, LXV	(787)	(790)	
East Mahanoy Junction.... LXV	1093	1096	
“ “ Tunnel, south end	1312	1315	
“ “ “ north end	1334	1337	
Mahanoy City Depot.....CXV	1235	1238	

*a* End of Little Schuylkill R. R. Catawissa and Williamsport R. R.



*LXIX. Mahanoy and Shamokin R. R.*

STATIONS.	Mean Tide.	Ocean Level.
Head of Grade (a) .....	1472	1475
Head of Mahanoy Plane .....	1479	1482
Foot of Mahanoy Plane .....	1127	1130
St. Nicholas Colliery.....	1155	1158
New Boston Colliery.....	1520	1523
Ashland Depot.....	881	884
Summit .....	1155	1158
Keystone .....	1025	1028
Benjamin Franklin Colliery.....	1175	1178
Locust Summit.....	1238	1241
Monteliers Colliery.....	1072	1075
Coal Ridge Colliery, No. 2 .....	1131	1134
Preston Colliery, No. 1.....	1090	1093
Cuyler Colliery, Raven Run.....	1360	1363
Girardville.....	1051	1054
Shenandoah City Depot.....	1244	1247
Head of Big Mine Run Plane.....	1275	1278
Locust Gap Junction.....	1029	1032
Greenback Colliery .....	895	898
Shamokin Depot.....	730	733
Trevorton Colliery.....	760	763
Herndon Junction (b).....	423	426

*a* South side Broad Mountain Summit.

*b* Junction with Northern Central R. W. at Herndon Station, 13½ miles from Trevorton.

NOTE. There are scores of small branching colliery roads and tracks to coal mines not mentioned in the foregoing tables. Civil and mining engineers in the Coal Region are earnestly requested to furnish all the authentic levels of the intersections of such roads, levels of switches, levels of mouths of gangways, and levels of determinate recognizable points on the surface, high and low, in their possession, to make this portion of the hypsometrical records of Pennsylvania as complete and useful as possible. [J. P. L.]

*LXX. Schuylkill Canal.*

The elevations on the Schuylkill Canal, were copied from a list furnished by Mr. James F. Smith, Chief Engineer, Reading, Penna.

The datum is mid tide, Philadelphia. The levels are deduced from a survey made in 1846.

*Schuylkill Navigation Company. Elevation of Combs of Dams.*

NAMES OF DAM.	No.	Above Mid-Tide.	Ocean Level.	Name of Town.
Fairmount.....	32	10	13	
Flatrock .....	31	36.10	39	
Plymouth .....	30	45.87	49	Conshohocken.
Norristown.....	29	57.36	60	
Catfish .....	28	62.19	65	
Pawlings.....	27	66.49	69	Perkiomen.
Black Rock.....	26	84.61	88	Phoenixville.
Vincent.....	25	102.07	105	
Lewis .....	24	177.86	181	
Poplar Neck.....	23	184.88	188	Lower Reading.
Kissingers .....	22	204.38	207	
Shepps .....	21	213.09	216	
Leizes .....	20	221.46	224	
Felix's .....	19	236.27	240	
Herbine's .....	18	265.95	269	Leesport.
Kernsville .....	17	364.93	368	
Blue M'tn. ....	16	389.83	393	
Hummels .....	15	409.03	412	
Lords .....	14	432.98	436	
Cross Cut .....	13	443.93	447	Auburn.
Dam No. ....	12	451.23	454	
" " .....	11	471.53	475	
" " .....	10	476.93	480	
" " .....	9	483.33	486	
" " .....	8	490.63	494	
" " .....	7	509.23	512	Schuylkill Haven.
" " .....	6	551.38	554	
" " .....	5	574.36	577	Second Mountain.
" " .....	4	583.83	587	Mount Carbon.
" " .....	3	592.23	595	" "
" " .....	2	613.83	617	Palo Alto.
" " .....	1	618.63	622	Port Carbon.

NOTE.—Levels as taken from a profile in the Penna. Canal Co's Office, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1851.

TOWNS.	Above Tide.		
Mount Carbon.....	620		
Schuylkill Haven.....	511		
Port Clinton.....	392		
Reading.....	195		
Pottstown.....	147		
Norristown .....	49		

*LXXI. Union Canal.*

The elevations on the Union Canal, were copied from a statement, giving number and lifts of locks, furnished through the kindness of Mr. B. B. Lehman, of Lebanon, Pa., formerly Chief Engineer and Genral Superintendent of the Union Canal.

*Elevation of Locks on Union Canal from Lebanon, Eastward.*

NO. OF LOCK.		Above Tide.	Ocean Level.
Lock No.	1.....	475.50	
"	2.....	471	
"	3.....	466.50	
"	4.....	462	
"	5.....	457.50	
"	6.....	453	
"	7.....	447.50	
"	8.....	440.50	
"	9.....	433.50	
"	10.....	427.50	
"	11.....	421.50	
"	12.....	414.50	
"	13.....	407.50	
"	14.....	401.50	
"	15.....	395.50	
"	16.....	387.50	
"	17.....	379.50	
"	18.....	373.50	
"	19.....	368.50	
"	20.....	362.50	
"	21.....	356.50	
"	22.....	351.50	
"	23.....	346.50	
"	24.....	340.50	
"	25.....	334.50	
"	26.....	328.50	
"	27.....	322	
"	28.....	315.50	
"	29.....	310.50	
"	30.....	305.50	
"	31.....	300.50	
"	32.....	295.50	
"	33.....	290.50	
"	34.....	285.50	
"	35.....	280.50	
"	36.....	275.50	
"	37.....	269.50	
"	38.....	264.50	
"	39.....	258.50	
"	40.....	253.50	
"	41.....	247.50	
"	42.....	241.50	
"	43.....	235.50	
"	44.....	230.50	
"	45.....	225.50	
"	46.....	220.50	
"	47.....	215.50	
"	48.....	210.50	
"	49.....	205.50	
"	50.....	200.50	
"	51.....	192.50	
"	52.....	185.50	
"	53.....	179	
"	54.....	169	

Lebanon (or Summit Level Union Canal) . . . . .	480
Middletown (Mouth of Swatara Creek) . . . . .	266
Reading (Schuylkill River) . . . . .	169
Pinegrove (Basin at former head of Navigation) . . . . .	483½

*Elevation of Locks on Union Canal from Lebanon, Westward.*

NO. OF LOCK.		Above Tide.	Ocean Level.
Lock No,	1.....	474.60	
"	2.....	469.20	
"	3.....	463.80	
"	4.....	458.40	
"	5.....	453	
"	6.....	447.60	
"	7.....	442.20	
"	8.....	436.80	
"	9.....	431.40	
"	10.....	426'	
"	11.....	420.60	
"	12.....	415.20	
"	13.....	409.80	
"	14.....	404.40	
"	15.....	399	
"	16.....	393.60	
"	17.....	384.60	
"	18.....	376.60	
"	19.....	368.60	
"	20.....	362.60	
"	21.....	356.60	
"	22.....	351.10	
"	23.....	345.60	
"	24.....	340.10	
"	25.....	334.60	
"	26.....	329.60	
"	27.....	324.60	
"	28.....	319.60	
"	29.....	314.60	
"	30.....	309.60	
"	31.....	303.60	
"	32.....	297.60	
"	33.....	291.60	
"	34 (At Middletown)...	285.60	
Susquehanna River }.....		266	
Mouth of Swatara Creek }.....			

*LXXII. Lebanon Valley R. R. (Steele.)*

NOTE.—This list was copied from a profile in the office of the Pennsylvania Company, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1857.

STATIONS.	Above Tide.	Ocean Level.
Harrisburg ..... I	314	
Hummelstown.....	362	
Palmyra .....	442	
Annville.....	395	
Lebanon .....	460	
Myerstown .....	468	
Womelsdorf .....	440	
Reading .....	253	
Birdsboro .....	165	
Pottstown.....	137	
Phoenixville.....	97	
Norristown.....	58	
Manayunk Falls.....	51	

## III. LEHIGH SERIES.

*C. North Pennsylvania R R*

The levels on the North Pennsylvania R. R. were copied from the profile in the office of the Company, by permission of Mr. S. W. Roberts, Chief Engineer and General Superintendent.

The datum, or base of levels, is Philadelphia City datum, 8.733' above mean surface of Atlantic Ocean. *Therefore 9 feet is added to make the second column.*

STATIONS.	City Datum.	Ocean Level.
Philadelphia Depot (a).....	19	28
Cohocksink .....	25	34
Diamond Street.....	30	39
Somerset Street.....	69	78
P. & R. Coal R. R. Crossing (b) . L	70	79
Tioga Street .....	94	103
Frankford Lane.....	92	101
Fisher's Lane.....	110	119
Green Lane.....	156	165
Oak Lane.....	192	201
City Line.....	184	193
York Road.....	176	185
Cnelton Hills.....	181	190
Paxon's Road.....	225	234
Abingdon Junction (c)..... CII	245	254
Edge Hill.....	284	293
Camp Hill.....	169	178
Edgehillville Road.....	167	176
Fort Washington.....	161	170
Ambler.....	190	199
Pennllyn. ....	230	239
Gwynedd.....	262	271

*a* At Willow Street.

*b* Crossing Philadelphia & Reading R. R.

*c* Intersection of Northeast Pennsylvania R. R. at Abington.



STATIONS.	City Datum.	Ocean Level.
Wissahickon Creek.....	342	351
Lansdale Junc. ( <i>d</i> ).....CIII, CIV	359	368
Hatfield.....	302	311
Zetty's Road.....	339	348
Nigger Hill.....	443	452
Sellersville.....	322	331
Tunnel.....	444	453
Koffler's Gap.....	521	530
Bunker Hill.....	519	528
Quakertown.....	487	496
Hilltop.....	546	555
Coopersburg.....	540	549
Summit ( <i>e</i> ).....	591	600
Koch's Mill.....	364	373
Yeager's Mill.....	339	348
Wagner's Mill.....	279	288
Hellertown.....	267	276
Hampton.....	267	276
Shimersville R. R. ( <i>f</i> ).....CV	255	264
Hess' Mill.....	259	268
Zinc Works.....	238	247
Bethlehem ( <i>g</i> ).....	228	237

A profile in the office of the Pennsylvania Canal Company, at Harrisburg, made under the direction of J. Dutton Steele, Civil Engineer, in 1857, gives the following very different levels of some of the points mentioned in the above list, and of others not mentioned in it. Some of the names seem to have been altered or reversed:

Wingohocking (Frankford Lane?) 92; Fisher's Lane, 110; City Lane (Oak Lane?) 192; Edgehill (York Road?) 175; Edgehill, 284; Fort Washington, 158; Wissahickon (Ambler?) 190; Gwynedd, 229; North Wales, 377; Lansdale, 371; Nigger-Hill, 440; Sellersville, 311; Koffler's Gap, 524; Bunker Hill, 519; Quakertown, 489; Same's Gap, 597; Hellertown, 270; Bethlehem, 249.

The datum is "Tide."

### CI. Delaware and Bound Brook R. R.

NOTE. For this road which is virtually a branch of the North Pennsylvania, leaving it at Jenkintown Station. See Appendix.

For the *Philadelphia and Newtown R. R.*, see under CLIII.

*d* Doylestown Branch and Stony Creek R. R. Crosses at Lansdale.

*e* Highest Point noted on profile of North Pennsylvania R. R. end of section 44, near Coopersburg, 591.50.

*f* Point of divergence of Shimersville Branch.

*g* The North Pennsylvania R. R. intersects the Lehigh Valley R. R. at this point.

*CII. Northeast Pennsylvania R. R.*

The levels on the Northeast Pennsylvania R. R. were furnished by Mr. S. W. Roberts, Chief Engineer and General Superintendent, N. P. R. R.

Base of levels, Philadelphia City datum, 8.733 above Ocean Level. Therefore nine feet is added to make second column.

STATIONS.	City Datum.	Ocean Level.
Abington Junction (a).....C	250	259
Summit .....	333	342
Willow Grove.....	250	259
Heaton .....		
Pennepack Creek.....	160	169
Fulmore.....		
Hatsborough.....	220	229
Hartsville.....	233	242

a Junction with the North Pennsylvania R. R. near Abington.

*CIII. Doylestown Branch N. P. R. R.*

The elevations on the Doylestown Branch of the North Penn R. R. were furnished by Mr. S. W. Roberts, Chief Engineer.

Base of levels, Philadelphia City datum, 8.733 above Ocean Level.

STATIONS.	City Datum.	Ocean Level.
Lansdale Junction (a).....C	359	368
Temperance Road.....	350	359
Neshaminy Creek.....	260	269
Road to Lexington.....	242	251
Cooke's Run.....	242	251
Bristol Road.....	294	303
Doylestown (b).....	338	347

a Point of divergence from N. P. R. R. at, or near Lansdale.

b Depot Ground at Doylestown.

*CIV. Stony Creek R. R.*

The levels on Stony Creek R. R. were copied from a profile furnished through the kindness of Mr. A. R. Roberts, Assistant Engineer, N. P. R. R.

The datum was fixed on the assumption that the elevation of the water in the Schuylkill River pool *below* Norristown, stood 49' above Mean Tide at Philadelphia. The elevation of the comb of the dam *at* Norristown, as shown by the notes of the Schuylkill Navigation Company, at Reading, Pa., is 57.36' above mid tide at Philadelphia.

The third column is made by adding three feet (3.349) to reduce to Mean Tide at Philadelphia to Ocean Level.

STATIONS.	Above Assumed Datum.	Mean Tide.	Ocean Level.	
Lansdale Junc. (a)....C	*350	†359	362	
1st Mile Post.....	350	359	362	
2d Mile Post.....	330	339	342	
Summit (b).....	350	359	362	
1st Crossing of Stony Cr.	215	224	227	
2d Crossing of Stony Cr.	143	151	154	
3d Crossing of Stony Cr.	104	113	116	
Norristown (c).....LI	50	59	62	

a With North Penn R. R. and with Doylestown Branch R. R.

\* Elevation as shown on profile.

† Elevation of Railroad Crossing as shown on profile of North Penn. R. R. Levels at the other stations of the table are made to correspond with the level of North Penn R. R., by adding 9 feet to Mr. Roberts' original figures.

b Between Wissahickon and Stony Creek.

c The level given in Table LI, of the Philadelphia and Reading R. R., Germantown and Norristown Branch, at Norristown is 62 (65 Ocean Level).

#### CV. Shimersville Branch N. P. R. R.

STATIONS.	Above Tide.	Ocean Level.	
Junction (a).....C	255	258	
Junction (b).....CXIV	217	220	

a Point of divergence from N. P. R. R. near Bethlehem.

b Junction with Lehigh Valley R. R.

#### CVII. Lehigh and Susquehanna R. R.

NOTE.—This road runs on the north and east bank of the Lehigh River most of the way. Its levels are similar to those of the Lehigh Valley road on the opposite bank.

STATIONS.	Tide.	Ocean Level.	
Easton (a).....			
Freemansburg.....			
Bethlehem (b).....CXIII	(240)	(243)	
Allentown Station.....			
Catasauqua (c) .....			
Laubach's.....			
Siegfried's Bridge .....			
Treichler's.....			
Walnut Port.....			
Lehigh Gap .....			

a Junction with Morris & Essex R. R.

b Junction with N. Penna. and with Lehigh and Lackawanna R. R's.

c Junction with Cat. & Fogelsville R. R.

STATIONS.	Tide.	Ocean Level.	
Parryville.....			
Weissport.....			
Lehighton.....			
Mauch Chunk ( <i>d</i> ).....			
Penn Haven Junction .....			
Rockport .....			
White Haven ( <i>e</i> ).....			
Penobscot.....			
Ashley ( <i>f</i> ) .....			
Wilkesbarre.....			
Pittston.....			
Moosic .....			
Scranton ( <i>g</i> ).....			
Green Ridge ( <i>h</i> ).....			

*CVIII. Mauch Chunk and Switch Back R. R.*

Mauch Chunk .....			
Summit Hill.....			

*CIX. Nesquehoning Valley R. R.*

Mauch Chunk.....			
Nesquehoning.....			
Hauto .....			
Hometown .....			
Tamienend .....			

*CX. Tamaqua Branch R. R.*

Hauto .....			
Coledale .....			
Tamaqua .....			

*CXI. Nescopec Branch R. R.*

White Haven.....			
Upper Lehigh.....			

*CXII. Nanticoke Branch R. R.*

Ashley .....			
Sugar Notch.....			
Hanover .....			
Nanticoke.....			
Wanamie.....			

*d* Junction with Nesquehoning Valley Branch; M. C. Summit Hill and Switchback R. R.

*e* Junction with Nescopec Branch.

*f* Junction with Nanticoke Branch.

*g* Junction with Del. Lack. & Western R. R.

*h* Junction with Delaware & Hudson R. R.

CXIII. *Lehigh and Lackawanna R. R.*

The elevations on the Lehigh and Lackawanna R. R., were furnished by Mr. Charles Brodhead, President of the Company, who says, "Our surveys carry us into the *Wind Gap*; and the highest point on the Turnpike, *in the Gap*, we found to be 738 feet above Bethlehem, or 978 feet above tide." The road runs as far as Steuben, 15 miles.

STATIONS.	Mean Tide.	Ocean Level.
Bethlehem Junction ( <i>a</i> )...CVII	240	243
Peter's Mills.....	255	258
Shimer's.....	287	290
Reiter.....		
Brodhead.....	315	318
Steuben.....	333	336
Bath.....	401	404
Chapman.....	576	579

*a* With Lehigh and Susquehanna R. R. at Bethlehem, on the north side of the Lehigh River.

CXIV. *Lehigh Valley R. R.*

The levels on the Lehigh Valley R. R. were copied from a list furnished by Mr. Robert H. Sayre, Chief Engineer and General Superintendent, Lehigh Valley R. R.

The datum is Mean Tide, Delaware River, three feet being added for Ocean Level in the second column.

*Note on the Lehigh Canal Levels.*

By a printed list of levels in the possession of Mr. George Ruddle, of Mauch Chunk, it appears that there is a rise in the

Lower grand section of Slackwater Navigation, from the Delaware River to Mauch Chunk (46 miles), of.....	360'.87
Upper grand section, Mauch Chunk to Wright's Creek (26 miles), of.....	599'.83
Upper grand section, Wright's Creek to Stoddart's Ville (    miles), of.....	336'.00
Adding to these figures, for the height of Bixler's Rift, Delaware Canal, above low tide in Delaware River.....	160.40
we get the following heights of the Lehigh Slackwater System:	
At Mauch Chunk, $360.87 + 160.40 =$ .....	521.23
At Wright's Creek, $521.23 + 599.83 =$ .....	1121.10
At Stoddart's Ville, $1121.10 + 336 =$ .....	1457.10

STATIONS.	Mean Tide.	Ocean Level.
Philipsburg ( <i>a</i> ).....CL	208	211
Delaware River, here.....	(148)	(151)
Easton.....	202	205
Redington.....		
Freemansburg.....	219	222

*a* 60' above Delaware River, Junction with Central R. R. of N. J., Morris and Essex R. R., Belvidere and Delaware R. R.

STATIONS.	Mean Tide.	Ocean Level.
Bethlehem.....	231	234
North Penn R. R. Junction ( <i>b</i> ).C	247	250
East Penn R. R. Junction...LXI		
Allentown.....	251	254
Catasauqua.....CXV	277	280
Hokindauqua.....CXV <i>bis</i>		
Whitehall.....	297	300
Coplay.....		
Laury's.....	326	329
Slatington.....	363	366
Lehigh Gap.....	385	388
Leighton.....	461	464
Mauch Chunk ( <i>c</i> )...CVIII	553	556
Glen Onoko.....		
Penn Haven Junction.....CXVI	705	708
Hickory Run.....		
Rockport ( <i>d</i> ).....	910	913
White Haven.....	1150	1153
Summit ( <i>e</i> ).....	1742	1745
Fairview ( <i>f</i> ).....	1675	1678
Newport.....	1024	1027
Warrior Run.....	710	713
Sugar Notch.....	670	673
South Wilkesbarre.....	550	553
Wilkesbarre ( <i>g</i> ).....	553	556
Plainsville.....	550	553
Pittston.....CXVIII	572	575
Lackawanna Junction ( <i>h</i> )...CLV	572	575
Ransom.....	584	587
Falls.....	590	593
McKunes'.....	600	603
Lagrange.....	600	603
Tunkhannock.....CXIX	614	617
Vosburg.....	617	620
Mehoopany.....	636	639
Meshoppen ( <i>i</i> ).....	646	649
Black Walnut.....	653	656
Laceyville.....	663	666
Wyalusing.....	678	681
Frenchtown.....	694	697
Rumnerfield.....	700	703
Standing Stone.....	706	709
Wysauking.....	716	719
Towanda ( <i>j</i> ).....CXX	738	741
Ulster.....	743	746
Athen's Bridge.....	776	779
Waverly ( <i>k</i> ).....CLXII	823	826

*b* Junction with East Penn. R. R. Elevation given by Philadelphia and Reading R. R. at this point 260'.

*c* 40' above Lehigh River.

*e* Nescopeck Mountain.

*g* 30' above Susquehanna River.

*h* 35' above Susquehanna River, Junction with Delaware, Lackawanna and Western R. R.

*i* 35' above Susquehanna River at Meshoppen.

*j* 28' above Susquehanna River at Towanda.

*k* 25' above Chemung River. At Waverly joins the New York and Erie R. R.

*d* 35' above Lehigh River.

*f* Top of Wyoming Mountain.



*CXV. Catasauqua and Fogelsville R. R.*

The levels of the Catasauqua and Fogelsville R. R. were furnished through the courtesy of Mr. Joshua Hunt, President of the Company.

The datum is Lehigh Valley R. R. at Catasauqua; which is 277' above tide; and therefore 280' above Ocean Level, as shown in the second column.

STATIONS.	Above Catasauqua.	Ocean Level.	
Catasauqua .....	0	280	
Seiple's .....	183	463	
Jordan Bridge (a).....	165	445	
Guth's.....	209	489	
Walbert.....	268	548	
Chapman .....	259	539	
Trexlerstown (b).....	129	409	
Spring Creek.....	101	381	
Alburtis (c).....	173	453	
Lock Ridge.....	158	438	
Gardner.....	387	667	
Red Lion.....	511	791	
Rittenhouse Gap.....	658	938	

*a* Water in creek at Jordan Bridge, 81 feet = Catasauqua; 361' = Tide.

*b* Allentown R. R. Crossing on grade.

*c* East Pennsylvania R. R. Crossing.

*CXV bis. Trenton R. R.*

NOTE. No levels of this road could be obtained.

*CXVI. Lehigh Valley Coal Branches.*

The elevations on the Branch Railroads owned by the Lehigh Valley R. R. Company were furnished by Mr. Robert H. Sayre, Chief Engineer and General Superintendent.

The datum is mean Tide, Delaware River.

STATIONS.	Mean Tide.	Ocean Level.	
Penn Haven Junction (a).....	705	708	
Black Creek (b).....	1015	1018	
Weatherly.....	1090	1093	
Hazle Creek Junction (c).....	1325	1328	
Hazleton.....			
Eckley .....			
Hazel Creek Junction (c).....	1325	1328	
Beaver Meadow.....	1355	1358	
Lewiston.....			
Jeanesville.....	1680	1683	
Yorktown Crossing (d).....	1750	1753	

*a* With Lehigh Valley R. R.

*b* Leaves here the Quakeake R. R. or Mahanoy Division.

*c* Of the Beaver Meadow R. R. with the Hazleton R. R.

*d* Divide between the Lehigh and Susquehanna waters.

STATIONS.	Mean Tide.	Ocean Level.
Audenreid.....	1735	1738
Hartz's.....		
Quakake Junction ( <i>e</i> ).....	1315	1318
Delano ( <i>f</i> ).....	1665	1668
Mahanoy City Junction.....LXV	1552	1555
Mahanoy City.....LXVIII	1230	1233
Shenandoah.....	1268	1271
Raven Run.....		
Centralia ( <i>g</i> ).....LXIV	1484	1487
Mount Carmel.....	1056	1059
Locust Gap.....	1027	1030
Fulton.....	960	963
Shamokin ( <i>h</i> ).....	730	733
Zerbe Summit ( <i>i</i> ).....	1073	1076
Zerbe Colliery.....	905	908

*e* Crosses at Yorktown the Catawissa R. R. Elevation (as given by Philadelphia and Reading R. R. at this point) 1350' feet above tide!

*f* Delano is on the divide between Schuylkill and Susquehanna waters.

*g* Centralia is on the divide between the Mahanoy and Shamokin waters.

*h* Shamokin Station 70' above the town.

*i* Zerbe Summit divides the Shamokin and Little Mahanoy waters.

#### *CXVII. Danville, Hazleton and Wilkesbarre R. R.*

The elevations on the Danville, Hazleton and Wilkesbarre R. R. were furnished by Mr. A. B. Starr, Assistant Engineer, P. & E. R.

The datum is *high* tide at the Schuylkill River, at Philadelphia. Add seven feet for Ocean Level.

STATIONS.	High Tide.	Ocean Level.
Sunbury Junction ( <i>a</i> ).....	436	443
Kline's Grove.....	438	445
Wolverton.....	435	442
Kipp's Run.....	456	463
Danville ( <i>b</i> ).....	456	463
Roaring Creek.....	452	459
Catawissa.....	464	471
R. R. Crossing ( <i>c</i> ).....	463	470
Mainville.....	582	589
Mifflin Cross Roads.....	804	811
Scotch Valley.....	1008	1017
Summit.....	1030	1037
Wolfon.....	1016	1023
Rock Glen.....	914	921
Gowan.....	992	999
Tomhicken ( <i>d</i> ).....	1221	1228

*a* Shamokin R. R. with Northern Central R. R. at Sunbury.

*b* With Lackawanna and Bloomsburg R. R.

*c* Catawissa R. R. Crossing; Elevation of Catawissa R. R. at same point 476.

*d* With Lehigh Valley R. R.

*CXVIII. Pennsylvania Coal Company's R. R.*

Elevations on the Pennsylvania Coal Company's R. R. from Pittston (or Port Griffith) to Hawley were copied from a profile in the Company's office at Pittston, Pa., by permission of Mr. George Johnson, Engineer.

The datum is 0 at foot of Plane No. I = 567.28 above Sea Level.

STATIONS.		Profile.	Above Tide.
Loaded track going out from Pittston.	Head of Plane.....No. 1	108	675
	“ “ ..... “ 2	206	773
	“ “ ..... “ 3	246	813
	“ “ ..... “ 4	397	964
	“ “ ..... “ 5	495	1062
	“ “ (Dunmore) “ 6	550	1117
	“ “ ..... “ 7	697	1274
	“ “ ..... “ 8	888	1455
	“ “ ..... “ 9	1077	1644
	“ “ ..... “ 10	1255	1822
	“ “ ..... “ 11	1217	1784
Tunnel .....		1400	1967
Empty track back to Port Griffith's.	Base of Plane.....No. 12	779	1346
	Head of Plane.....No. 12	928	1495
	Hamlin .....	329	896
	Head of Plane.....No. 13	511	1078
	“ “ ..... “ 14	640	1207
	“ “ ..... “ 15	733	1300
	“ “ ..... “ 16	830	1397
	“ “ ..... “ 17	874	1441
	“ “ ..... “ 18	955	1522
	“ “ ..... “ 19	998	1565
	“ “ ..... “ 20	952	1519
Foot of Plane .....	“ 21	1040	1607
	“ 22	246	813
		64	631

*CXIX. Montrose R. W.*

Elevations on the Montrose Railway were furnished by Mr. James I. Blakslee, President of the Company.

The datum, or base of levels, is that of grade on the Lehigh Valley R. R. at Tunkhannock.

STATIONS.	Mean Tide.	Ocean Level.
Tunkhannock (a).....CXIV	614	617
Marcy.....	968	971
Lemon.....	1044	1047
Avery.....	932	985
Meshoppen Creek.....	936	939
Lynn.....	1035	1038
Springville.....	1260	1263
Tylersville.....	1403	1406
Dimock.....	1510	1513
Hunter's.....	1550	1553
Cool's.....	1550	1553
Allenville.....	1652	1655
Montrose.....	1659	1662

a Junction with Lehigh Valley R. R.

*CXX. Barclay and Schrader R. R.*

Elevations on the Barclay and Schrader R. R's were furnished by Mr. A. W. Stedman, Engineer of the Pa. & N. Y. R. R. & Coal Co., at Towanda, Pa., through the solicitation of Mr. James Macfarlane.

The datum is mean tide at Philadelphia.

STATIONS.	Mean Tide.	Ocean Level.	
Towanda ( <i>a</i> ).....CXIV	732	735	
Towanda ( <i>b</i> )... ..	719	732	
Monroeton Junction ( <i>c</i> )...CXXI	756	759	
Masontown ( <i>d</i> ).....	788	792	
Greenwood.....	817	820	
Lamoka.....	1036	1039	
Foot of Plane ( <i>e</i> ).....	1265	1268	
Head of Plane ( <i>f</i> ).....	1750	1753	

*Schrader\* R. R.*

R. R. Switch ( <i>g</i> ).....	1795	1798	
R. R. Switch ( <i>h</i> ).....	1782	1785	
Carbon Run ( <i>i</i> ).....	1923	1926	
Lowest Point ( <i>j</i> ).....	1970	1973	
Summit.....	2035	2038	

\*This Railroad, four miles long, connects the Barclay R. R. with the Schrader Coal Mines.

*a* Switch at Upper Depot.

*b* Barclay Depot.

*c* With State Line and Erie R. R.

*d* Barclay R. R. Bridge rail.

*e* Elevation estimated.

*f* Rail in Plane-house.

*g* Upper Switch connecting with Barclay R. R.

*h* Lower Switch connecting with Barclay R. R.

*i* Rail under Breaker is 1923'.

*j* Lowest Point of Coal near Breaker.

*CXXI. State Line and Erie R. R.*

Levels on the State Line and Erie R. R. were copied from a profile in the office of the Company at Towanda, Bradford County, Pa. There were no stations, or names of towns, noted on the profile, the elevations being marked at mile posts, and therefore, the stations have been located from J. A. Anderson's R. R. map. The levels as shown in this list may not be entirely correct; but it is the only record which could be found.

The datum is Mean Tide at Philadelphia.

STATIONS.	Mean Tide.	Ocean Level.	
Monroeton Junction ( <i>a</i> ).....CXX	756	759	
Wilcox.....	1117	1120	
New Albany.....	1191	1194	
Miller's.....	1324	1327	
Bushore.....(?)	1587	1590	
Bernice.....	1852	1855	

*a* With Barclay R. R.

## IV. DELAWARE SERIES.

*CL. Philadelphia and Trenton R. R.*

Levels on the Philadelphia and Trenton, and Belvidere Division of the Pennsylvania R. R. were furnished by Mr. F. B. Fiddler, Engineer in the office of the Company at Trenton, N. J. The levels were deduced from the original table of grades by Samuel H. Kneass, Engineer.

The datum of the Philadelphia and Trenton R. R. is mean tide at Philadelphia. The datum of the Belvidere Division of the Pennsylvania R. R. is water in canal at junction of feeder with Delaware and Raritan Canal near Trenton, which water level is four feet below the railroad track.

*Philadelphia, Trenton and Belvidere Division, Pennsylvania R. R.*

STATIONS.	Mean Tide.	Ocean Level.
Philadelphia.....		
Kensington ( <i>a</i> ).....	29	32
Bridge over Frankford Creek....	24	27
Frankford Station ( <i>b</i> ).....	29	32
Bridesburg ( <i>c</i> ).....	29	32
Tacony.....	31	34
Bories.....	32	35
Cornwell's.....	36	39
Eddington ( <i>d</i> ).....	39	42
Bristol ( <i>e</i> ).....	18	21
Tullytown.....	17	20
Penn Valley.....	18	21
Morrisville ( <i>f</i> ).....	31	34
Trenton Junction ( <i>g</i> ).....	60	63
Washington's Crossing.....	64	67
Prime Hope Saw Mills.....	CLI	
Lambertville.....	72	75
Prallsville.....	83	86
Bull's Island ( <i>h</i> ).....	94	97
Warford's Rock.....	CLI	
Frenchtown.....	125	128
Milford.....	137	140
Holland.....	CLI	
Reigelsville.....	163	166
Carpenterville.....	175	178
Phillipsburg (*).....CXIV	195	198
Martin's Creek.....	231	234
Belvidere.....	268	271
Manunka Chunk.....	320	323
Walker's Ferry Water Gap.....	CLI	

*a* Frankford Road Crossing.

*b* Middle of Church Street.

*c* Middle of Bridge Street.

*d* Dunk's Ferry Road.

*e* Middle of Market Street.

*f* N. E. side of Washington Street.

*g* The railroad track is four feet above the water in the canal.

*h* Elevation of railroad, head of Bull's Island, 97'. Low water in Delaware River 74'.

\* Lehigh Valley R. R.

*CLI. Delaware River Levels.*

NOTE.—The following levels of ordinary low water in Delaware River above mean tide at Philadelphia (= 3.349 above mean ocean level) were obtained in the office of the Philadelphia and Trenton R. R. at Trenton, from Mr. F. B. Fidler, C. E., deduced from the original grade tables by Mr. S. H. Kneass.

PLACES.	Mean Tide.	Ocean Level.
Trenton .....		
Washington's Crossing.....	20	23
Prime Hope Saw Mills.....	35	38
Lambertville.....	49	52
Bull's Island.....	71	74
Head of Bull's Island.....	74	77
Warford's Rock.....	91	94
Frenchtown.....	104	107
1.7 miles above " (a).....	107.7	111
Milford.....	111	114
4 miles above " (b).....	121.8	125
Holland.....	116	119
1½ miles below Reigelsville.....	124.2	127
Reigelsville.....	127	130
¾ mile above ".....	130	133
1.6 mile above ".....	133.8	137
Carpenterville.....	137	140
2½ miles below Phillipsburg (c).....	148.6	151
Phillipsburg.....	157	160
1¾ mile above ".....	165.2	168
2.7 miles above ".....	170.4	173
7.6 miles above ".....	192.8	196
2.84 miles above Martin's Cr. (d).....	200.4	204
4.14 miles above ".....	210.9	214
Belvidere.....	232	235
Manunka Chunk.....	262	265
Walker's Ferry at Delaware Water Gap.....	298	301

*CLII. Delaware Canal.*

Elevations on the Delaware Canal were copied from a map made under the direction of the Lehigh Coal and Navigation Company, in 1826, by Isaac A. Chapman. The map is in possession of Mr. George Ruddle, Mauch Chunk.

The datum is low tide Delaware River, 3.349 above Ocean Level.

a Huntingdon County, N. J., 31.7 miles above Trenton.

b " " " not the Milford of Pike County, Pa.

c Opposite Easton, in New Jersey.

d Above Easton, in Pennsylvania.



POINTS ON LINE OF CANAL.	Low Tide.	
	Feet.	Inches
Trenton Falls; head; 49 miles below the mouth of Lehigh River.....	9	8
Gould's Rift; head.....	16	8
Yardleyville.....	18	
Scudder's Rift; head.....	24	8
Taylor's Rift; head.....	33	6
Buck Tail Rift; head.....	36	5
Will's Falls; head.....	49	9
New Hope.....	50	
33 miles below Lehigh River.....	53	3
Green Banks Rift; head.....	58	9
Gallopen's; head.....	68	3
Bull's Falls; head.....	72	2
26 miles below Lehigh River.....	72	9
Cut Bite Rift; head.....	77	4
Tumbling Dam Falls; head.....	89	1
Marshal's Island Rapids; head.....	100	7
Man of War Rift; head.....	102	3
Stunt's Falls; head.....	107	2
Firman's Falls; head.....	110	11
Nockamixon Falls; head.....	117	6
Linn's Falls; head.....	124	10
11 miles below Lehigh River.....	126	10
10 miles below Lehigh River.....	127	3
Durham Falls; head.....	130	3
9 miles below Lehigh River.....	130	4
Greavelly Falls; head.....	133	3
Rocky Falls; head.....	136	1
Ground Hog Rift; head.....	138	1
Old Sow Rift; head.....	145	7
Clifford's Rift; head.....	150	10
Bixler's Rift; head (a).....	160	5

*a* This point is about one-half mile below the mouth of Lehigh River.

#### CLIII. Philadelphia and Newtown R. R.

NOTE.—See Appendix.

#### CLIV. Flemington R. R.

Levels on the Flemington R. R. were copied from a list prepared by Mr. F. B. Fiddler, in the R. R. office, at Trenton, N. J.

The datum is mean tide Delaware River, = 3.349 above Ocean Level.

STATIONS.	Mean Tide.	Ocean Level.	
Flemington Junction (a).....CL	73	76	
Mount Airy.....	147	150	
Ringoes.....	248	251	
Summit (b).....	255	258	
Copper Hill.....	159	162	
Flemington.....	183	186	

*a* Junction with Belvidere and Delaware R. R.

*b* N. E. of Ringoes.

NOTE.—Two other short lists in New Jersey are here appended, on account of their connections with the Delaware River lines. Other New Jersey Railway levels are published by Prof. Cook in his Annual Reports of the Geological Survey of that State.

*Morris and Essex R. R.*

The Morris and Essex R. R. levels were furnished by Mr. James Archbald, Chief Engineer, Del. L. & W. R. R.

STATIONS.	Mean Tide.	Ocean Level.	
Phillipsburg.....CL	217	220	
Phalcony Creek.....	341	344	
Stewartsville.....	370	373	
Washington Depot.....	503	506	
Port Murray.....	585	588	

*Belvidere and Newtown R. R.*

NOTE.—The Belvidere and Newtown levels were copied from a list furnished by Mr. F. B. Fiddler, Trenton, N. J.

STATIONS.	Mean Tide.	Ocean Level.	
R. R. Junction (a).....CL	272	275	
Belvidere.....	283	286	
Sarepta.....	361	364	
Hope.....	478	481	
Howell P. O.....	562	565	
Summit.....	595	598	
Johnsburg.....	568	571	
Summit.....	628	631	
Newton.....	607	610	

a Junction with B. D. R. R.

*CLV. Delaware, Lackawanna and Western R. R.*

Elevations on the D. L. & W. R. R. were copied from a profile in the office of the Company at Scranton, by permission of the Assistant Engineer, Mr. Bryson.

The datum is mean tide, Delaware River, = 3.349 above Ocean Level.

STATIONS.	Above Tide.	Ocean Level.	Corrected.
Junction (Central R.R. of N. J)..			
Washington (Morris & Essex R.R.)			
Oxford Furnace.....			
Bridgeville.....			
Manunka Chunk.....CL			
Delaware Bridge.....	290	293	
Portland.....	288	291	
Delaware Water Gap.....	316	319	

STATIONS.	Above Tide.	Ocean Level.	Corrected.
Stroudsburg .....	400	403	
Spragueville.....	487	490	
*Henryville .....	593	596	
*Oakland.....	1008	1011	
*Paradise.....	1518	1521	
Forks .....			
Tobyhanna (a).....	1929	1932	
Gouldsboro. ....			
Summit .....	1887	1890	
*Moscow. ....	1555	1558	
*Dunning's.....	1397	1400	
Greenville.....	1182	1185	
Scranton.....CLVI, CXVIII	740	743	
Clark's Summit.....	1239	1242	
Abington.....	1055	1058	
Factoryville.....	917	920	
Tunnel.....	963	966	
Nicholson .....	766	769	
Hopbottom. ....	890	893	
Foster.....			
Oakley's. ....	942	945	
Montrose Station.....	1050	1053	
New Milford.....	1084	1087	
Great Bend.....	876	879	
State Line.....	860	863	
Corbettsville.....	852	855	
Conklin.....	849	852	
Binghamton.....CLXII	843	846	

a The highest point noted on the profile, 1970 feet above tide. This point is between Tobyhanna & Summit.

\* Elevations at stations marked thus (\*) were not marked on the profile; neither could it be exactly determined what was the vertical scale of the profile; but it was supposed to be 290 feet to the inch.

The following list is therefore added, some of its figures corresponding exactly with those above. It was obtained from a profile in the office of the Pennsylvania Canal Co., at Harrisburg, made under the direction of J. Dutton Steele, in 1851.

STATIONS.	Above Tide.	Ocean Level.	
White House.....	170	173	
Lebanon.....	274	277	
Clinton.....	326	329	
New Hampton Summit .....	505	508	
West End Switch.....	498	501	
Delaware Bridge.....	293	296	
Delaware Water Gap.....	314	317	
Stroudsburg .....	422	425	
Naglesville.....	1961	1964	
Greenville.....	1182	1185	
Scranton.....	739	742	

CLVI. *Bloomsburg Division, D. L. & W. R. R.*

Elevations of the Bloomsburg Division of the Delaware, Lackawanna and Western R. R. were copied from notes, in the possession of Mr. A. Bryson, Jr., Div. Engineer, at Scranton, Pa. This list contains all the levels that could be obtained of this road.

STATIONS.	Mean Tide.	Ocean Level.	
Scranton.....CLV	740	743	
Taylorville.....	683	686	
Lackawanna Junction.....	573	576	
Pittston.....	573	576	
West Pittston.....	580	583	
Wyoming.....	560	563	
Maltby.....	560	563	
Kingston.....	551	554	
Plymouth Junction.....	545	548	
Plymouth.....	539	542	
Avondale.....	534	537	
Nanticoke.....			
Hunlock's Creek.....			
Schickshinny.....			
Beach Haven.....			
Berwick.....			
Brier Creek.....			
Espey.....			
Bloomsburg.....			
Rupert.....			
Catawissa Bridge.....			
Danville.....			
Northumberland.....			
Sunbury.....			

CLVII. *Lackawanna R. R.*

Elevations on the Lackawanna R. R. between Carbondale and Scranton were furnished by Mr. A. H. Vaudling, Superintendent Delaware and Hudson Canal Co.'s R. R. at Providence, Luzerne County, Pa.

The datum is "Tide;" but whether high tide or mean tide is not known. Supposing it to be *mean* tide, 3.349 feet is added for Ocean Level.

STATIONS.	Above Tide.	Ocean Level.	
Carbondale (a).....CLX	1083	1086	
Jermyn.....	968	971	
Archbald.....	965	968	
Olyphant.....	807	810	
Providence (b).....	700	703	

a Coal Brooke Breaker in Carbondale. The *canal level* at Carbondale is given by J. D. Steele as 965; see Table CLVIII.

b Elevation at the Lackawanna.

CLVIII. *Carbondale & Honesdale R. R.*

Levels on the Carbondale and Honesdale Railroad are in accordance with a profile furnished by Mr. A. H. Vandling, Superintendent of the Delaware and Hudson Canal Company, office of coal department, at Providence Penna. According to the profile which is marked, "Profile B, New Road," the *loaded* track starts from Carbondale at a point marked 1012 feet above tide; and the *empty* track starts at a point marked Honesdale 1000 feet above tide. In J. D. Steele's list (CLVIII) Carbondale and Honesdale are both alike called 965' above tide, at the level of the canal.

STATIONS.		Above Carbondale.	Above Tide.	
Loaded cars, eastward.	Carbondale, lower end.....	00	1012	
	Head of Plane 1.....	240	1252	
	Head of Plane 2.....	377	1389	
	Head of Plane 3.....	579	1591	
	Head of Plane 4.....	762	1774	
	Head of Plane 5 ( <i>a</i> ) .....	923	*1935	
	Head of Plane 6.....	906	1918	
	Head of Plane 7.....	572	1584	
	Foot of Plane 7 ( <i>b</i> ).....	440	1452	
Empty cars back.	Honesdale..... CLIX	00	1000	1003
	Head of Plane 1.....	180	1180	1183
	Head of Plane 2.....	178	1178	1181
	Head of Plane 3.....	290	1290	1293
	Head of Plane 4.....	424	1424	1427
	Head of Plane 5.....	502	1502	1505

CLIX. *Honesdale Branch Erie Railway.*

STATIONS.	Above Tide.	Ocean Level.	
Honesdale.....CLVIII	966		
White Mills.....	925		
Hawley .....	899		
Kimbles.....	849		
Millville .....	780		
Rowlands .....	700		
Lackawaxen .....	650		

CLX. *Delaware and Hudson Canal.*

This list is from J. Dutton Steele's profile of 1851, in Penna. Canal Co.'s office, at Harrisburg.

TOWNS.	Above Tide.	Ocean Level.	
Carbondale.....CLVII	965		
Honesdale.....	965		
Hawley.....	880		
Port Jarvis.....	455		
Port Clinton.....	455		

*a* Summit.

*b* From this point to Honesdale, a distance of 10 miles, there is a regular descent of 44 feet to the mile.

*CLXI. Jefferson Branch, Erie Railway.*

STATIONS.	Above Tide.	Ocean Level.	
Lanesboro Junction ( <i>a</i> )....CLXII	982		
Ninevah Junction.....	981		
Brandts.....	1047		
Stevens Point.....	1078		
Webster's Mills.....	1297		
Starrucca.....	1424		
Thompson.....	1703		
Ararrat Summit.....	2023		
Herrick Centre.....	1803		
Uniondale.....	1693		
Forrest City.....	1481		
Carbondale.....	1079		

*a* With the Erie Railway at Lanesboro, in Susquehanna Co., Pa., about 190 miles from New York City. This road runs south to the Anthracite Coal field.

*CLXII. Erie R. R. Line.*

Levels on the Erie Railway were copied from profiles furnished by Mr. H. D. Blunden, Assistant Engineer. The profiles are complete, embracing the main line of road from Jersey City to Dunkirk, and all branches owned by the Erie Railway Company.

The datum is tide water at Jersey City. This, if *mean tide*, may be considered equivalent to Ocean Level.

*Erie R. R.—Delaware Div.*

STATIONS.	Above Tide.	Ocean Level.	
Port Jervis.....	440		
Pond Eddy.....	571		
Shoholo.....	648		
Lackawaxen.....CLX	648		
Pine Grove.....	668		
Narrowsburg.....	714		
Nobodys.....	748		
Cohecton.....	748		
Callicoon.....	781		
Rock Run.....	787		
Hawkins.....	809		
Basket.....	830		
Bouchon.....	850		
Lordville.....	864		
Stockport.....	896		
Hancock.....	926		
Dickinsons.....	954		
Hales Eddy.....	974		
Deposit.....	1009		
Summit.....	1373		
Susquehanna.....CLXI	914		



*Erie R. R.—Susquehanna Div.*

Great Bend.....	884		
Binghamton.....CLV	868		
Hooper.....	839		
Union.....	834		
Campville.....	830		
Owego.....	822		
Tioga.....	805		
Smithboro.....	799		
Waverly.....	836		
Chemung.....	820		
Wellsboro.....	831		
Elmira.....	863		
Corning.....CLXIV	942		
Painted Post.....	947		
Erwins.....	983		
Addison.....	993		
Rathboneville.....	1015		
Cameron Mills.....	1029		
Cameron.....	1056		
Santees.....	1067		
Adrian.....	1112		
Canesteo.....	1134		
Hornellsville.....	1161		

*Erie R. R.—Western Div.*

Tip Top Summit.....	1783		
Andover.....	1676		
Genessee.....	1511		
Scio.....	1458		
Philipsville.....	1390		
Belvidere.....	1384		
Friendship.....	1539		
Cuba Summit.....	1698		
Cuba.....	1542		
White House.....	1514		
Hindsdale.....	1501		
Olean.....	1438		
Allegheny.....	1422		
Vandalia.....	1415		
Carrollton.....CLXVI	1399		
Great Valley.....	1393		
Salamanca.....	1384		
Little Valley.....	1594		
Cattaraugus.....	1411		
Persia.....	1390		
Smith's Mills.....	1010		
Forestville.....	883		
Dunkirk (a).....	600		

*a* The elevation given at Dunkirk by Lake Shore and Michigan Southern R. R., is 24.94 + 573. L. Erie = 597.94.

## CLXIII. Erie R. R.—Buffalo Div.

STATIONS.	Above Tide.	Ocean Level.	
Arkport.....	1199		
Burns.....	1203		
Canaseraga.....	1260		
Garwoods.....	1280		
Swains.....	1312		
Turnout.....	1319		
Nunda.....	1336		
Hunts.....	1339		
Portage.....	1314		
Castile.....	1401		
Gainesville.....	1407		
Warsaw.....	1326		
Dale.....	1178		
Linden.....	1181		
Attica.....	998		
Tonawanda.....	1003		
Summit.....	1086		
Griswold.....	1044		
Darien.....	1024		
Alden.....	868		
Town Line.....	742		
Lancaster.....	683		
Checktowga.....	661		
East Buffalo.....	611		
Buffalo.....	588		

## CLXIV. Corning, Cowanesque &amp; Antrim Railway.

The levels on Corning, Cowanesque and Antrim Railway, were furnished by Mr. A. H. Gorton, Supt. The levels on this road have been reduced to the datum of the New York and Erie Railway, by adding 26 feet to Mr. Gorton's figures.

STATIONS.	Tide.	Corrected Tide.	
Corning.....CLXII	*918	†942	
Ernin Centre.....	952	976	
Lindley.....	973	997	
Lawrenceville.....CLXV	982	1006	
Nelson.....	1162	1186	
Elkland.....	1118	1142	
Lawrenceville.....CLXV	982	1006	
Tioga Village.....	1028	1052	
Holliday.....	1127	1151	
Middleburg.....	1154	1178	
Niles Valley.....	1168	1192	
Wellsboro.....	1295	1319	
Summit.....	1838	1862	
Antrim Coal Mines.....	1648	1672	

\* Grade at Corning Junction according to Mr. Gorton.

† Grade at Corning Junction by profile of Erie Railway.

## CLXV. Tioga R. R.

Levels on the Tioga R. R. were furnished by Mr. S. B. Elliott, Engineer of the T. R. R.

The datum is asserted to be that of the Erie R. R. at Corning; in other words the following figures have been constructed on the basis of the Erie R. R. list, without reference to Mr. Gorton's intermediate station levels.

STATIONS.		Above Tide.	Ocean Level.
<i>Lawrenceville</i> .....CLXIV		1006	
Somer's Lane .....		1018	
Mitchell's Creek.....		1022	
Old Station .....		1035	
Tioga.....		1042	
Mill Creek .....		1077	
Lamb's Creek.....		1111	
Mansfield.....		1140	
Canoe Camp.....		1163	
Covington.....		1208	
<i>Blossburg</i> .....		1348	
Morris Run ( <i>a</i> ).....		1678	
Arnot ( <i>b</i> ).....		1682	
Fall Brook ( <i>c</i> ).....		1842	

*a, b, c* Coal Mines in the Blossburg Basin.

## CLXVI. Bradford Branch, Erie Railway.

STATIONS.	Above Tide.	Ocean Level.	
Carrollton Junction ( <i>a</i> )....CLXII	1400		
Ernins Mills .....	1409		
Limestone.....	1415		
Babcock .....	1429		
Bradford .....	1464		
DeGoliass .....	1510		
Big Shanty .....	1715		
Crawfords .....	2098		
Summit ( <i>b</i> ).....	2140		
Alton .....	2080		
Gilesville.....	2016		

*a* With the Erie R. R., 407 miles from New York. This road runs south to the coal fields of McKean Co., Pa.

*b* Highest point on the profile just south of Crawfords.

## V. SUSQUEHANNA SERIES.

*CC. Northern Central.*

Levels on the N. C. R. R. were copied from an old lithographed profile in the office at Baltimore, Md.

Datum : Mean tide at Baltimore ; equivalent to + Ocean level.

STATIONS.	Mean Tide.	Ocean Level.	
Baltimore .....			
B. & P. R. R. Junction.....			
Mount Vernon.....	131		
Green Spring Junction (a) CCLV			
Timonium .....	381		
Cockeysville.....			
Sparks.....			
Monkton .....			
Parkton.....	420		
Freelands .....	596		
New Freedom.....	827		
Seitzland .....	611		
Glen Rock .....	551		
Hanover Junction (b) .....	422		
Smysers.....	389		
Glatfelter's .....	335		
Tunnel .....	299		
York (c).....CCVI, CCVII	366		
Emigsville .....	376		
Mount Wolf.....	376		
Summit, No. 2.....	466		
Conewago Bridge.....	289		
York Haven.....	291		
Goldsboro.....	304		
Middletown Ferry .....	307		
Marsh Run .....	307		
New Cumberland.....	312		
Bridgeport (d).....CCIX	355		
Marysville .....	350		
Dauphin (e).....LXIII			
Clark's Ferry.....	361		
Halifax .....	378		
Liverpool.....			
Mohontongo.....			
Millersburg (f).....CCXI	396		
Georgetown .....	417		
Trevorton Junction (g)....LXIX	428		
Fisher's Ferry.....	433		
Selinsgrove.....	438		
Sunbury (h) .....	444		

a With Green Spring Branch N. C. R. R.

b With Hanover Branch, Han. & Gett. R. R.

c Junction with Peach Bottom R. R. and with York and Columbia R. R., and York & Gettysburg R. R.

d Opposite Harrisburg. Junction with Cumberland Valley R. R.

A list of levels of some of the above named points made by J. D. Steele, in 1851, was obtained in the office of the Penna. Canal Co., at Harrisburg, and is given for comparison, as follows:

STATIONS.	Mean Tide.	Ocean Tide.	
Mellvale .....	168		
Timonium .....	395		
Ashland .....	269		
Monckton .....	344		
Parkton.....	430		
Summit.....	860		
Glenrock.....	556		
Glatfelter's.....	472		
York.....	373		
Conewago Creek.....	285		
Bridgeport.....	343		
Dauphin.....	332		
Halifax.....	360		
Lykens V. R. R. Junction .....	380		
Millersburg.....	382		
Georgetown.....	417		
Sunbury.....CCXV	429		

*CCI. Tide Water and Susquehanna Canal.*

Levels on the T. W. & S. Canal, were copied from a profile in the office of the Schuylkill Navigation Company, at Reading, Pa., by permission of Mr. James F. Smith, Chief Engineer.

Datum, *low tide* at Havre de Grace. Information on the spot leads to the belief that the tide rises here  $2\frac{1}{2}$  feet.

*Tide Water Canal.*

STATIONS.	Above Low Tide.	Ocean Level.	
Level of Chesapeake Bay.....	0		
Lock No. 9, surface of water ....	10		
Lock No. 8, " " ....	16		
Lock No. 7, " " ....	26.5		
Lock No. 6, " " ....	37		
Lock No. 5, " " ....	47		
Lock No. 4, " " ....	57		
Lock No. 3, " " ....	67		
Lock No. 2, " " ....	77		

*e* Junction with Schuylkill and Susquehanna R. R.

*f* Junction with Lykens Valley Coal R. R. (Summit Branch R. R.)

*g* With Mahanoy and Shamokin Branch P. & Reading R. R.

*h* Junction 1. With Shamokin Division R. R. (CCXIV). 2. With Danville Hazleton and Wilkesbarre R. R. (CXVII). 3. With Philadelphia & Erie R. R. (CCXV). Note. The cars of the Northern Central run on the P. & E. R. R. to Williamsport, and then on the leased line from Williamsport to Canandaigua, once called the Williamsport and Elmira R. R., and now known as the northern extension of the Northern Central R. R.

*Susquehanna Canal.*

Lock No. 19, (next to No. 2, T. W. C)	85		
Lock No. 18, upper level.....	93		
Lock No. 17, " " .....	103		
Lock No. 16, " " .....	114		
Lock No. 15, " " .....	123		
Lock No. 24, " " .....	125		
Lock No. 23, " " .....	134		
Lock No. 22, " " .....	143		
Lock No. 22, " " .....	152		
Lock No. 20, " " .....	161		
Lock No. 9, " " .....	170		
Lock No. 8, " " .....	177.5		
Lock No. 7, " " .....	185		
Lock No. 6, " " .....	193		
Lock No. 5, " " .....	201		
Lock No. 4, " " .....	209		
Lock No. 3, " " .....	217		
Lock No. 2, " " .....	225		
Lock No. 1, " " .....	233		
Aqueduct across Cabin Branch Creek.....	233		
Grand Lock at Wrightsville, oppo- site Columbia.....	233		

*CCII. Pennsylvania Canal, E. D.*

Elevations on the Pennsylvania Canal, Eastern Division, were furnished by  
Mr. Thos. T. Wierman, Jr.

Datum is *mean tide*, Chesapeake Bay.

STATIONS.	Mean Tide.		
Columbia Dam, surface.....	221		
Canal Basin, (Columbia).....	236		
Susquehanna River below Cone- wago Falls.....	244		
Susquehanna River above Cone- wago Falls.....	263		
Harrisburg Canal Basin ( <i>a</i> ).....	312		
Clark's Ferry Dam .....	333		

*a* Surface of water in the large (Porter's) Basin at Harrisburg . . . . . 320

Floor of vestibule of the State Capitol at Harrisburg . . . . . 361

*CCIII. Juniata Division Pennsylvania Canal.*

Juniata River, Mouth :—			
Mitre Sill of Stop Lock at Junc- tion..... CCIV	347		
Millerstown dam, surface.....	376		
Lewistown dam, " .....	442		
Canal at Lewistown " .....	450		
Anghwick dam, " .....	492		
Canal at Huntingdon " .....	586		
Huntingdon :			
Lower Mitre Sill of Lock No. 40	599		



*CCIV. West Branch Division Pennsylvania Canal.*

Juniata River, Mouth :—(b)			
Mitre Sill of Stop Lock at Junction.....	CCIII	347	
Liverpool, water in River .....		368	
Liverpool, water in Canal .....		381	
Water in			
River below Shamokin dam ...		411	
Shamokin dam, at Sunbury....		419	
Canal at Northumberland..	CCV	432	
Lewisburg dam (c).....		424	
Canal opposite Lewisburg.....		445	
Muncy dam .....		459	
Loyalsoch dam and Canal.....		502	
Canal at Williamsport .....		509	
Lock Haven dam.....		540	
Queens Run dam.....		546	
Bald Eagle dam.....		559	

b Surface of water of Pool of dam at Duncan's Island . . . . . 332

c This dam has no connection with the Canal, and is therefore at a lower level.

*CCV. Wyoming Division Pennsylvania Canal.*

Northumberland; canal level	CCIV	432	
Bench Mark at Northumberland..		434	
Danville; canal level .....		443	
Bloomsburg; canal level.....		470	
Below Berwick; canal level.....		480	
Shickshinny; canal level.....		500	
Nanticoke dam .....		504	
Wilkesbarre; canal level.....		534	
Water in river above Wilkesbarre		511	
Top of coping Plainsville Lock...		541	

*CCVI. Peach Bottom R. R.*

Levels of the Peach Bottom R. R. were copied from notes in the office at York.

Datum: Susquehanna River at Peach Bottom, on the assumption that the water in the river at Peach Bottom stood at 85.88 feet above tide.

According to the profile of the Frederick Division of the Pa. R. R., the elevation of York above tide at Baltimore, is 364.6 feet. This is the latest determination. Sixteen feet have therefore been subtracted to make the second column.

This R. R. is a 3 foot or "Narrow Gauge," and connects with the Northern Central R. R. at York.

STATIONS.	Assumed Datum.	Corrected Tide.	
Susquehanna River Water .....	(85.88)	(70)	
Peach Bottom ( <i>a</i> ) .....	92.27	76	
Bangor Summit .....	511.23	495	
Delta .....	435.37	419	
Bryansville.....	241.36	225	
Woodbine.....	294.21	278	
Bridgeton.....	304.89	289	
Bruce.....	331.50	315	
Muddy Creek .....	366.86	351	
High Rock .....	382.93	367	
Laurel.....	411.62	395	
Fenmore .....	434.64	418	
Brogueville.....	478.19	462	
Felton.....	536.46	520	
Windsor .....	598.8	583	
Springvale .....	734.4	718	
Red Lion.....	912.31	896	
Dallastown .....	657.00	641	
Ore Valley .....	570.32	554	
Enterprise.....	531.20	515	
Smalls Mills.....	433.75	418	
Springgarden .....	431.53	415	
York ..... CC, IV CCVII	381.24	365	

*a* There is a Peach Bottom R. R. in Lancaster Co., branching from the Philadelphia and Baltimore Central, at Oxford, (see table CCLII,) and intended to connect with this line of York Co. at Peach Bottom, on the Susquehanna River.

*CCVII. Pennsylvania Railroad, Frederick Division.*

Levels of the Frederick Division, Pa. R. R., were copied from a profile of the road, in the office of the Pa. R. R. at Philadelphia, by permission of Mr. W. H. Brown, Engineer for Maintenance of Way.

Datum: Mean tide at Baltimore.

STATIONS.	Mean Tide.	Ocean Level.	
York ( <i>a</i> ).....IV, CC	365		
Codorus Creek.....	357		
Graybills .....	426		
Bairs.....	452		
Spring Forge.....	455		
Menges Mill.....	455		
Iron Bridge.....	496		
Jacobs Mill .....	504		
R. R. Crossing ( <i>b</i> ).....	607		
Hanover.....	599		
Conewago Bridge .....	546		
Littlestown .....	619		
Bridge .....	623		

*a* Junction with Northern Central; with York Branch of Columbia R. R.; and with Peach Bottom.

*b* Hanover Junction and Gettysburg R. R. Crosses at grade.

STATIONS.	Mean Tide.	Ocean Level.	
State Line.....	540		
Piney Creek.....	505		
Galts.....	486		
Taneytown .....	493		
R. R. Crossing (c).....CCLV	426		
Ladiesburg.....	464		
New Midway.....	458		
Woodsborough .....	400		
Georgetown .....	290		
Ritters.....	301		
Harmony Grove.....	310		
Frederick.....	280 (?)		
B. & O. Junction (d).....CCLVI	375		

c Western Maryland R. R., but *not at grade*.

d Connection with Baltimore and Ohio R. R.

### CCVIII. Cumberland Valley R. R.

Levels on the Cumberland Valley R. R., were furnished by Mr. J. B. Dougherty, Engineer of the road at Chambersburg.

Datum: Originally a point on the Penna. R. R. at Harrisburg, foot of Market street, 315 feet above high water at Philadelphia.

STATIONS.	High Tide.	Ocean Level.	
Harrisburg (a).....I, CC	315	322	
Susq. Bridge, (west end) (b)....	350	357	
Shirmanstown .....			
Mechanicsburg .....	429	436	
Dillsburg Junction (c).....CCIX	420	427	
Kingston .....			
Middlesex.....			
South Mountain Junction (d)....	451	458	
Carlisle .....	470	477	
Greason's.....			
Newville .....	526	533	
Oakville .....			
Shippensburg .....	647	654	
Summit (e) .....	776	783	
Scotland .....			
Mount Alto Junction (f).....	707	714	
Chambersburg.....	611	618	
Marion .....			
South Pennsylvania Junction (g)	625	632	
Greencastle.....	578	585	
State Line.....			
Hagerstown .....	565	572	
Falling Waters.....			
Potomac Bridge.....	369	376	
Beddington.....			
Martinsburg (h) .....	457	634	

a Junction with Penna. R. R., and with Northern Central R. R.

b Bridgeport. c Dillsburg Junction. d South Mountain R. R. Junction.

e Mount Alto R. R. Junction. f Southern Penna. R. R. Junction.

g Junction with Baltimore and Ohio R. R.

*CCIX. Mechanicsburg and Dillsburg R. R.*

Levels on the Mechanicsburg and Dillsburg R. R. were copied from notes in possession of Mr. J. B. Dougherty, Assistant Engineer on the Cumberland Valley R. R., at Chambersburg, Pa.

Datum: That of the Pa. R. R., high tide at Philada.

STATIONS.	High Tide.	Ocean Level.	
Mechanicsburg Junc. (a) CCVIII	420	427	
Dillsburg.....	536	542	

a With Cumberland Valley R. R. at Mechanicsburg, 8.5 miles west of Harrisburg.

*CCIX bis. South Mountain R. R.*

No levels of this road could be obtained. It runs south from Carlisle by Papertown, to Pinegrove Furnace, on Mountain Creek in the South Mountains.

STATIONS.			
Carlisle Junction (a) ....CCVIII			
Bonny Brook .....			
Craigh Head's.....			
Mount Holly Springs.....			
Upper (Paper) Mill.....			
Hunter's Run.....			
Henry Clay .....			
Laurel .....			
Pinegrove (Furnace).....			

*CCX. Mount Alto R. R.*

Levels on the Mount Alto R. R., were furnished by Mr. George B. Wiestling, Engineer and Superintendent.

Datum is "Elevation of Rail at foot of Market street, Harrisburg, 315.2 above high tide in Schuylkill River at Philadelphia."

This road runs to Mount Alto Furnace at the west foot of the South Mountain.

STATIONS.	High Tide.	Ocean Level.	
C. V. R. R. Junction (a).....	705	712	
Summit (b) .....	732	739	
Brookside (c) .....	700	707	
Woodstock (d).....	708	715	
Chambersburg Turnpike (e) ....	740	747	
Reno Ore Bank .....	875	882	
Mount Alto (f) .....	961	968	

a Junction with Cumberland Valley R. R., near Chambersburg.

b Between C. V. R. R. and Conococheague Creek.

c At crossing of Creek.

d At crossing of Creek.

e Chambersburg and Gettysburg Turnpike,

f Near the Furnace.

*CCX bis. Southern Pennsylvania R. R.*

No levels could be obtained.

STATIONS.		Ocean Level.	
C. V. R. R. Junction ( <i>a</i> ) CCVIII			
Williamson.....			
Lehmaster's.....			
Mercersburg Junction.....			
Loudon.....			
Richmond.....			
Mercersburg terminus ... ..			

*a* One mile south of Marion, and seven miles south of Chambersburg.

*CCXI. Summit Branch R. R.*

Levels of the Summit Branch R. R., were furnished by Mr. W. E. Ray, Supt. of the R. R., and cannot be relied upon as being entirely correct; but it is the only record which could be found of the road.

This road is called also the Lyken's Valley R. R.

Datum: Mean tide at Baltimore.

STATIONS.	Mean Tide.	Ocean Level.	
Millersburg ( <i>a</i> ).....	395		
Elizabethville.....			
Cross Road.....	660		
Lykenstown.....	675		
Wiconisco.....			
Big Lick Colliery.....			
Williamstown ( <i>b</i> ).....	1125		

*a* On the Susquehanna River, east side; junction with Northern Central Railroad.

*b* Summit Branch Colliery. Connection broken for several miles with the Railroad from Brookside, past Good Spring, to Tremont and Pottsville.

*CCXII. Selinsgrove and N. B. R. R.*

Elevations on the line of the Selinsgrove and North Branch R. R. and of the Mifflintown Branch, of the same, were copied from notes in possession of Mr. W. A. Meeker, at Selinsgrove, Pa.

Datum assumed at a point on the D. L. & W. R. R. at Northumberland.

The second column gives the correlative heights above mean tide (Ocean level?) at Baltimore.

NOTE. This R. R. has never been built. Only the preliminary line levels at the points named are given in the following table.

The line starts in Northumberland at the terminus of the Bloomsburg Division of the Delaware, Lackawanna & Western R. R., crosses the mouth of the West Branch Susquehanna, and keeps down the right bank of the Susquehanna River, to the mouth of the Juniata River (Table CCXII).

The other branch of the line strikes across country from Selinsgrove to the Juniata River at Mifflintown (Table CCXIII).

STATIONS.	Assumed Elevation.	Mean Tide.	Ocean Level.
Northumberland ( <i>a</i> )..CLVCCXV	100	439	
River Road ( <i>b</i> ).....	86.4	426	
Keensville .....	84.9	424	
Selinsgrove ( <i>c</i> ).....	88.7	428	
Burns dwelling house .....	67.9	407	
Pa. Canal ( <i>d</i> ).....	70.6	410	
B. M., No. 16 ( <i>e</i> ).....	74.7	414	
Port Trevorton R. R. Tra k.....	75.9	415	
Herrold's Saw Mill.....	63.3	403	
B. M., No. 18 ( <i>f</i> ).....	72.6	402	
Wentzels Station.....	66.3	406	
McKee's Half Falls.....	63.1	402	
Rines Store.....	60.2	400	
B. M., No. 21 ( <i>g</i> ).....	60.6	400	
Mahontonga Creek ( <i>h</i> ).....	38.2	378	
B. M., No. 23 ( <i>i</i> ).....	61.5	401	
B. M., No. 24 ( <i>j</i> ) .....	54.9	385	
B. M., No. 25 ( <i>k</i> ).....	50.9	390	
Liverpool ( <i>l</i> ) .....	57.3	397	
Blattenberger's Mill .....	34.8	374	
Blattenberger's Creek ( <i>m</i> ).....	16.4	356	
B. M., No. 27 ( <i>n</i> ) .....	31.4	371	
Montgomery's Creek ( <i>o</i> ).....	14.5	354	
Girty's Notch Hotel .....	26.2	366	
B. M., No. 28 ( <i>p</i> ).....	19.1	358	
New Buffalo ( <i>q</i> ) .....	24.6	364	
Buffalo Creek ( <i>r</i> ) .....	8.5	348	
B. M., No. 31 ( <i>s</i> ) .....	18	357	
Pittsburg Turnpike Crossing ....	15.2	355	
B. M., No. 33 ( <i>t</i> ) .....	-1.8	338	
Juniata River.....	-11.6	328	
Juniata Canal ( <i>u</i> ).....	18.4	353	
Pa. R. R. ( <i>v</i> ) .....	23.5	363	
B. M., No. 34 ( <i>w</i> ).....I	19.6	359	

*a* Intersection with D. L. & W. R. R., at Northumberland.

*b* Opposite Northumberland.

*c* Centre of Pine Street.

*d* Top of mason work abutment of aqueduct,  $2\frac{1}{2}$  miles below Selinsgrove, crossing Penns Creek.

*e* Spike driven in telegraph pole, just above Port Trevorton.

*f* Below Port Trevorton, near two dwelling houses, on root of apple tree, 300' from canal.

*g* 1500' south of Benneville Kramer's house, on root of wild cherry tree.

*h* Surface of water, ordinary stage.

*i* 900' north of Hoover's hotel, on chestnut tree.

*j* 2000' south of "Dry Saw Mill" Hotel, piece of horse shoe, driven in telegraph pole.

*k* 500' south of McCormick's barn, on root of elm tree.

*l* Centre of Market street.

*m* Surface of water.

*n* 900' north of stone hotel, on root of black walnut tree.



## CCXIII. Mifflintown Branch S. &amp; N. Br. R. R.

NOTE. See last table CCXII.

STATIONS.	Assumed Elevation.	Mean Tide.	Ocean Level.
B. M., No. 1 ( <i>a</i> ).....CCXII	101.2	441	
Kautz P. O. ( <i>b</i> ) .....	95.5	435	
Millers Mill.....	134.4	474	
Freeburg.....	157.2	497	
Apple's Brick House .....	205.8	545	
Road ( <i>c</i> ).....	263	602	
Cross Creek .....	286.5	626	
B. M., No. 13 ( <i>d</i> ).....	375	714	
Shelly's Saw Mill ( <i>e</i> ).....	451.4	791	
Shelly's Summit .....	453.2	793	
Richfield .....	412.6	752	
B. M., No. 14 ( <i>f</i> ).....	408.7	748	
Cherryhill School House ( <i>g</i> ) ....	366.8	706	
Evansdale Summit.....	399	738	
Haldeman's Store ( <i>h</i> ).....	377.4	717	
Bunkertown Church ( <i>i</i> ) .....	350.3	690	
Bunkertown .....	354.3	694	
Little Lost Creek ( <i>j</i> ).....	355.4	695	
McAlistersville.....	308.6	648	
Leonard s Barn.....	262.9	602	
Wilson's Mill.....	227.2	566	
Wilson's Store.....	219.5	559	
Main Road ( <i>k</i> ).....	224	563	
Banks Summit .....	270.6	610	
Happy Hollow School House ( <i>l</i> )..	160.5	500	
Daniel Seiber's ( <i>m</i> ).....	137.3	477	
Terminus of Line ( <i>n</i> ).....I	109.2	449	

*a* Top of mile post No. 7, S. & L. R. R.*b* Waters edge, ordinary low water, Middle Creek.*c* Leading from Middleburg to Tremont.*d* 1300' west of Brick School House, root of white oak tree.*e* Waters edge, head of Shelly's saw mill pond.*f* Near rivulet.*g* Public road crossing.*h* Public road from Evansburg to Foutz Valley, opposite Haldeman's store.*i* In public road, near Bunkertown Church.*j* Surface of water.*k* In main road, from McAlistersville to Mifflintown, one mile west of Oak-land mills.*l* Surface of water, creek or run, west of Happy Hollow school house.*m* Surface of water in creek, at D. Seibers.*n* Mifflintown, on large peg, with nail driven near corner of stable, at fence post.*o* Surface of water.*p* Point of rocks, foot of Girty's Mountain, spike driven in telegraph pole*q* Water in mill race.*r* Surface of water.*s* 700' south of J. Steel's dwelling house, on root of black walnut tree.*t* 600' south of Pittsburgh turnpike crossing, on root of hickory tree, on river bank.*u* On towing path, Juniata Canal.*v* On cross tie, Pa. R. R., near Duncannon.*w* On top of locust stump, at edge of embankment of Pa. R. R.

## CCXIV. Shamokin Branch N. C. R. R.

The elevations on Shamokin Branch of the Northern Central R. R., were furnished by Mr. A. B. Starr, Assistant Engineer P. & E. R. R.

Datum: Mean tide, Baltimore.

STATIONS.	Above Tide.	Ocean Level.	
Sunbury Junction ( <i>a</i> ).....CC	442		
Snydertown.....	497		
Shamokin.....	738		
Lancaster Branch ( <i>b</i> ).....	831		
Mount Carmel.....	1054		
End of Road.....	1090		

*a* Junction with N. C. R. W., at Sunbury.

*b* Junction with Lancaster Branch.

## CCXV. Philadelphia and Erie R. R.

The levels on the Philadelphia and Erie R. R. were copied from the notes in the office of the Company at Williamsport, Pa., by permission of Mr. A. B. Starr, Assistant Engineer. These levels were made subsequent to 1862. It is intended to re-level the road in 1876, for no reliance is placed on the levels in this Table by the Engineers of the road.

Datum: Mean Tide at Baltimore.

STATIONS.	Mean Tide.	Corrected Levels.	
Sunbury ( <i>a</i> ).....CC	428.30		
D. H. & W. R. R. Junc. ( <i>b</i> ). CXVII	436.10		
Northumberland ( <i>c</i> ).....CLV	439.30		
Montandon ( <i>d</i> ).....XIII	446.60		
Catawissa R. R. Crossing ( <i>e</i> )..LXV	454.50		
Milton.....	458.30		
Watsontown.....	465.62		
Dewart.....	470.40		
Catawissa R. R. Crossing ( <i>f</i> ) LXV	473.82		
Montgomery.....	474.10		
Muncy.....	502.75		
Catawissa R. R. Crossing ( <i>g</i> )..LXV	514.42		
Williamsport.....	510.43		
W. & E. (N. C.) Railroad Junction ( <i>h</i> ).....CCXVII	516.02		
Newberry.....	513.20		
Linden.....	517.21		

*a* Junction of Shamokin Branch of the Northern Central R. R.

*b* Junction Danville, Hazleton and Wilkesbarre R. R.

*c* Junction of Delaware, L. & W. R. R.

*d* Junction of Lewisburg, Centre & Spruce Creek R. R.

*e* Crossing of Catawissa R. R. near Milton.

*f* Crossing Catawissa R. R. near Montgomery.

*g* Crossing Catawissa R. R. below Williamsport.

*h* Junction with Northern Central R. W. near Williamsport.

STATIONS.	Mean Tide.	Corrected Levels.	
Susquehanna.....	516.60		
Jersey Shore.....	*577.07		
Pine.....	554.11		
Wayne.....	554.34		
Lock Haven ( <i>i</i> ).....XV	†538.91		
Queen's Run.....	565.05		
Farrandsville.....	564.63		
Ferney.....	576.44		
Glen Union.....	587		
Whetham.....	600.80		
Ritchie.....	614.34		
Hynes.....	626.30		
North Point.....	641.02		
Renova.....	653.90		
Westport.....	672.64		
Cook's Bun.....	691.43		
Keating.....	700.90		
Wistar.....	720.72		
Round Island.....	736.81		
Grove.....	754.40		
Sinnemahoning.....	775.71		
Bennett's Br. Extension ( <i>j</i> ) CCCII	795		
Driftwood.....	797.75		
Huntley.....	842.93		
Sterling.....	896.38		
Cameron.....	943.73		
B. N. Y. & P. R.R. ( <i>k</i> ) CCXVIX	1003.09	(1024)	
Emporium.....	1014.99		
West Creek.....	1091.75		
Beechwood.....	1225.66		
Rathbon.....	1299.18		
Hemlock.....	1446.05		
West Creek Summit.....	1677.64		
St. Mary's.....	1649.50		
Scahonda.....	1503.90		
Daguschahonda ( <i>l</i> ).....	1461.95		
Shawmut ( <i>m</i> ).....	1408.56		
Ridgway.....	1375.73		
Johnsonburg.....	1423.52		
Willmarth.....	1428.80		
Wilcox.....	1508.52		
Dahoga.....	1586.75		
Clarion Summit.....	2007.90		
Kane.....	2002.83		
Wetmore.....	1792.63		
Ludlow.....	1591.55		
Roy Stone.....	1403.75		

\* Probably 557.07. † 558.91? See next Table below. See also the 555 of Table XV.

*i* Junction with Bald Eagle Valley R. R.

*j* Junction with the Bennett's Branch Extension of Allegheny Valley R. R.

*k* Junction with the Buffalo, New York & Philadelphia R. R.

*l* Here the Daguchahonda R. R. joins. No levels got.

*m* Shawmut R. R. No levels got.

STATIONS.	Mean Tide.	Corrected Levels.	
Sheffield.....	1325.70		
Tiona.....	1348.03		
Clarendon.....	1385.46		
Stoneham.....	1335.93		
Warren.....CCCVI	1182.60		
Oil Creek & A. V. R. R. Cross- ing.....CCCVI	1158.80		
Irvineton.....	1156.60		
Youngsville.....	1199.85		
Pittsfield.....	1233.31		
Garland.....	1297.47		
Spring Creek.....	1383.85		
Columbus.....	1389.18		
B. C. & P. R. R. Crossing ( <i>l</i> ) CCCIX	1429.20		
Corry.....	1419.58		
A. & G. W. R. R. Crossing ( <i>m</i> ) CCC	1415.92	(1439)‡	
Lovell's.....	1362.90		
Concord.....	1373.80		
Union.....	1258.63		
Lebeuff.....	1207.20		
Waterford.....	1181.72		
Jackson's.....	1218.70		
Langdon's.....	1123.52		
Belle Valley.....	995.96		
L. S. & M. S. Railroad Cross- ing ( <i>n</i> ).....CCCLXXXIII	675.64		
Erie Depot.....CCCLXXXIV	(573)		
Lake Erie, Water.....	(565)	(573)‡	

*l* Crossing of the Buffalo, Corry and Pittsburgh R. R.

*m* Crossing of the Atlantic & Great Western R. R.

*n* Junction with the Lake Shore and Michigan Central at Erie.

‡ Level by the N. Y. & E. R. R.

‡ Accepted level of Lake Erie.

NOTE.—In the following Table some levels according to a profile made by John F. Burgin, Civil and Topographical Engineer, in 1862, are compared with levels of the same points found in Table CCXV above.

Column 1 shows Mr. Burgin's figures.

Column 2 shows the office figures.

STATIONS.	Above Tide.	Above Tide.	Difference.
Sunbury.....	423	428	+ 5
Milton.....	451	458	+ 7
Williamsport.....	506	510	+ 4
Lock Haven ( <i>a</i> ).....	552	539	+ 7
De Crano.....	716		
2d Fork Sinnamahoning.....	787	798 ?	+ 11
Emporium.....	1011	1015	+ 4
Foot of Maximum Grade.....	1330		

*a* The 539 must be an error for 559.

STATIONS.	Above Tide.	Above Tide.	Difference.
West Creek Summit.....	1682	1678	— 4
St. Mary's ( <i>b</i> ).....	1628	1649	+21
Foot of Maximum Grade.....	1518		
Ridgway ( <i>c</i> ).....	1387	1376	— 9
Johnsonburg.....	1429	1424	— 5
Wilcox.....	1501	1509	+ 8
Foot of Maximum Grade.....	1525		
Clarion Summit.....	2006		
Head of Two Mile Run.....	1914		
Foot of Maximum Grade.....	1456		
Sheffield.....	1324	1326	+ 2
Dutchman's Summit.....	1393		
Warren.....	1189	1183	— 6
Irvine.....	1162	1157	— 5
Youngsville.....	1203	1200	— 3
Pittsfield.....	1236	1233	— 3
Garland.....	1298	1297	— 1
Spring Creek Station.....	1381	1384	+ 3
Columbus.....	1388	1389	+ 1
Corry.....	1416	1420	+ 4
Logan's Summit.....	1429		
Lovell's.....	1363	1363	0
Concord.....	1372	1374	+ 2
Union.....	1259	1259	0
Le Boeuf.....	1205	1207	+ 2
Waterford.....	1181	1182	+ 1
Jackson.....	1218	1219	+ 1
Langdon's.....	1123	1124	+ 1
Belle Valley.....	994	996	+ 2
Erie Depot.....	573		
Lake Erie Surface ( <i>d</i> ).....	565		

*b* Difference of 21 feet probably to be accounted for on the supposition that two different points are indicated, the gradients here being very steep.

*c* Head of the Clarion River, at the forks.

*d* The level of Lake Erie water was fixed by J. T. Gardner's Tables (U. S. Geol. and Geographical Survey of Colorado, for 1873, p. 635) "mean of observations from 1844 to 1857, 573.08;" adopted result at Cleveland, dependent upon repeated Erie Canal Levels and U. S. Coast Survey work.

### CCXVI. Muncy Creek R. R.

The levels on the Muncy Creek R. R. were furnished by Mr. B. Morris Ellis, Treasurer.

Datum: Catawissa; (Reading) R. R. Mid tide at Philadelphia. Add 3 feet, for Ocean Level.

This R. R. line runs northeast, up Muncy creek to the top of the Allegheny or Great North Mountain table land of Sullivan County.

STATIONS.	Mean Tide.	Corrected Tide.
Hall's Station ( <i>a</i> ) .....LXV	410	510
*Hughesville ( <i>b</i> ).....	483	583
Picture Rock.....	551	651
Tivola.....	591	691
Muncy Bottoms.....	675	775
Sonestown.....	829	929
McNeal's Summit ( <i>c</i> ).....	1676	1776

*a* On Catawissa R. R. east bank of River.

*b* Mr. B. Morris Ellis, says, "This station is 80 feet higher than the Muncy Station (west side of river) on P. & E. R. R." called in Table CCXV, 502.75, and therefore, Hughesville is 582.75. Accordingly 100' is added to Mr. Ellis' 483, and therefore to all other figures in the first column to make the second.

*c* This is the dividing ridge, between the Loyalsock and Muncy Creeks, which head within one-fourth mile of each other. It is known as McNeal's Summit, an engineer of that name having established a "bench" at this point many years since. It is two miles south of the town of Laporte (B. Morris Ellis).

*Elevations of points in Sullivan County, Pa., furnished by Mr. B. Morris Ellis, of Hughesville, Pa.*

In Cully township, in front of the hotel, at Long Pond, it is 2235' above tide.

On the turnpike, one mile west of Long Pond, 2285', the highest *known* point in Sullivan County.

At Lewis Lake, or Eagles Meare, it is 1726'.

### CCXVII. Williamsport and Elmira R. R.

(NOW NORTHERN CENTRAL.)

Levels on this Northern Division of the Northern Central R. R. from Williamsport to Canandaigua, were copied from a profile in the office of the Company at Elmira. This road runs north up Lycoming creek.

Datum: Mean tide at Baltimore, Md.

STATIONS.	Mean Tide.	Ocean Level.
Williamsport ( <i>a</i> ).....CCXV	540	
Cogan Valley.....		
Crescent.....		
Trout Run.....		
Bodine's .....		
Ralston.....	860	
Roaring Branch.....		
Carpenter's.....	1200	
Canton .....	1250	
Minnequa .....	1230	
Alba.....		
West Granville.....		
Granville Summit.....	1393	

*a* Junction with Philadelphia and Erie R. R.



STATIONS.	Mean Tide.	Ocean Level.	
Troy .....	1100		
Columbia Cross Roads.....			
Snedeker's.....			
Gillett's.....			
New York State Line.....			
Elmira (b).....CLXII	865		
Horse Heads.....			
Pine Valley.....			
Mill Port.....			
Croton.....			
Havana.....	400		
Watkin's.....			
Rock Stream.....			
Starkey.....			
Himrod's.....			
Milo.....			
Pennyman.....			
Benton.....			
Hall's.....			
Stanley (c).....			
Hopewell.....			
Canandaigua (d).....	1070		

b Crosses New York and Erie R. R.

c Junction with Ontario and Southern R. R.

d Connects with New York Central and H. R. R., and Canandaigua and Tonawanda R. R.

#### CCXVIII. Jersey Shore, Pine Creek, and Buffalo R. R.

Levels on the J. S., P. Cr., and Buffalo R. R. were furnished by Mr. John S. Ross, Auditor. Datum: "Atlantic Ocean." This road is not yet built.

STATIONS.	Ocean Level.		
Williamsport, City limit (a) CCXV	502		
Linden (Surface of Canal).....	501		
Larry's Creek (on Plank Road)..	514		
Jersey Shore (Main Street).....	521		
Pine Creek Crossing (Lentz)....	532		
" " (Ramsey's Bend)	558		
Waterville (Surface Little Pine Cr)	587		
Jersey Mills.....	626		
Campbelltown .....	673		
Pine Cr. Crossing (near Slate Run)	709		
" " " Cedar "	760		
Babb's Creek Road.....	833		
Pine Cr. Crossing (ab. Marsh Cr.)..	1106		
Gaines' (Water, Pine Creek).....	1219		
Kilbourne's (Water, Pine Creek)..	1274		
Grade at Summit of Tunnel.....	2202		
Coudersport .....	1634		
Roulette.....	1510		
Port Allegheny (b).....CCXIX	1454		

a The Canal level at Williamsport, however is 509 according to Table CCIII.

b On Buffalo, N. Y. & Phila. R. R.—The difference between the Tables 1479—1454 = 25' is unexplained.

## CCXIX. Buffalo, New York and Philadelphia R. R.

Elevations on the B. N. Y. and P. R. R. were furnished by Mr. Geo. S. Gatchell, Engineer, who writes: "Calling Lake Erie 573' above tide, *our* elevation at the crossing of the Erie Railway, at Olean, is 1435. Erie (R. R. levels) 1438, difference 3'. At Buffalo our elevation is 11' above what we took to be surface of water in Lake Erie, but I do not think it is exactly right. We assumed surface of water in Lake Erie from surface of water in Buffalo Creek, about 3 miles from the Lake. Lake Erie, 573'; our depot, 11' = 584; Erie Railway (levels) 583; difference 4'. You see the difference at Olean & Buffalo is very near the same. The Erie Railway here (at Olean), is on about the same elevation as our track."

STATIONS.	+Lake Erie	Above Tide	Erie R. R. Correction.	
Emporium ( <i>a</i> ).....CCXV	448	1021	1024	
Shippen.....	630	1203	1206	
Keating (Summit).....	1305	1878	1881	
Liberty.....	1070	1643	1646	
Port Allegheny .....	906	1479	1482	
Larabee's.....	905	1478	1481	
Eldred.....	867	1440	1443	
State Line.....	867	1440	1443	
Portville.....	866	1439	1442	
Olean ( <i>b</i> ).....CLXII	862	1435	1438	
Hindsdale.....	880	1453	1456	
Ischua.....	965	1538	1541	
Franklinville.....	1017	1590	1593	
Machias.....	1080	1653	1656	
Yorkshire.....	882	1455	1458	
Arcade.....	881	1454	1457	
Protection.....	807	1380	1383	
Holland.....	600	1173	1176	
South Wales.....	414	987	991	
Aurora.....	348	921	925	
Jamieson.....	317	890	894	
Elma.....	250	823	827	
Spring Brook.....	180	753	757	
Ebenezer.....	63	636	640	
Buffalo ( <i>c</i> ).....	11	584	588*	

*a* On the Philadelphia and Erie R. R. where the unreliable list of the P. & E. R. R. makes the elevation 1003.09.

*b* Crosses New York & Erie R. R.

*c* Uses the same depot with the N. Y. & E. R. R., Lake Shore & M. S. R. R.

## ———. Daguschahonda R. R.

## CCXX. McKean and Buffalo R. R.

Elevations on the McKean and Buffalo R. R. were furnished by Mr. S. V. Godden, Superintendent.

Datum: Lake Erie. To which must be added 573' to reduce to Ocean Level.

The first column gives heights above an originally assumed Lake level. The second column corrects these heights for true Lake level.

STATIONS.	Above Lake Erie.	Above Lake Erie.	Above Tide.
Buff. N. Y. & P. R. R. ( <i>a</i> ) CCXIX	873.00	896.50	1469
Larabee's.....	871.50	895	1468
Frisbee.....	860.50	884	1457
Farmer's Valley.....	871.50	895	1468
Smethport.....	889.06	913	1486
Crosby.....	936.30	960	1533
Colegrove.....	938.80	962.30	1535
Hamlin.....	953.00	976.50	1549
Wernwag.....	1256.50	1280	1753
Clermont ( <i>b</i> ).....	1469.50	1493	2066

*a* Junction with the Buffalo, New York and Philadelphia R. R. near Larabee's Station, on the Upper Alleghany River. *b* Bishop's Summit.

## VI. SOUTHERN SERIES.

### *CCL. West Chester and Philadelphia R. R.*

The levels of the West Chester and Philadelphia R. R., were copied from the profile, by permission of Mr. Thos. H. Hall, Treasurer of the Company.

Datum: Ordinary *low* water at Philadelphia. This is about the same as Ocean Level.

STATIONS.	Above Tide.	Ocean Level.
Philad'a Depot, 31st & Chestnut st	14	14
Woodland Street.....	57	57
Angora.....	74.5	74.5
Fernwood.....	90	90
Darby Road.....	103	103
Kelleyville.....	102	102
Clifton.....	109	109
Springhill.....	128	128
Morton.....	121.5	121.5
Swarthmore.....	125	125
Wallingford.....	168	168
Manchester.....	211.5	211.5
Media.....	210	210
Greenwood.....	218	218
Glen Riddle.....	160	160
Lenni.....	136	136
West Chester Junction ( <i>a</i> ) CCLII	133	133
Darlington.....	143	143
Glen Mill.....	199	199
Cheney.....	240	240
Street Road.....	252	252
Hemphill.....	318	318
West Chester.....	406	406

*a* With Philadelphia and Baltimore Central R. R.

## CCLI. West Chester R. R.

Elevations of points on the West Chester Railroad, were copied from a profile made in 1831, in possession of Mr. Thos H. Hall, Treasurer, at the office of the Company, in Philadelphia. There is no location of the present stations on the profile, therefore the elevations in the following list, are given at the points where marked on the profile.

Datum: "Tide;" but a correction of 21 was needful; see note *b*; add 7 feet for Ocean level below P. R. R. datum.

STATIONS.	"Tide."	Corrected Tide.	Ocean Level.
West Chester .....			
Liberty Grove ( <i>a</i> ) .....	475.6	455	462
Goshen Street .....	474.6	454	461
Jones Hill .....	540	519	526
Ship Road .....	471	550	557
Steamboat Road .....	599.50	579	586
Summit .....	607.33	587	594
Malvern Junction P. R. R. ( <i>b</i> )..I	560	539	546

*a* The starting point of the road in the eastern part of the town of West Chester.

*b* Junction with Pennsylvania R. R. at Malvern Station. The elevation of the Pa. R. R. at this point is + 539.253. The levels on West Chester Railroad have been reduced to correspond with Pa. R. R.

## CCLII. Philadelphia and Baltimore Central R. R.

Levels on the Philadelphia and Baltimore Central Railroad, were copied from a profile furnished by Mr. H. Wood, Gen'l Supt.

Datum is said to be *mid tide* at Philadelphia = about Ocean level.

STATIONS.	Above Tide.	Ocean Level.	
Lamokin Junction ..... CCLIII			
Rockdale .....			
Lenni .....			
West Chester Junction ( <i>a</i> ).. CCLI	133	133	
Chester Heights .....	234	234	
Patterson .....			
Woodland .....	212	212	
Concord .....	237	237	
Brandywine Summit .....	273	273	
Chadd's Ford .....	129	129	
Fairville .....	255	255	
Rosedale .....	312	312	
Kennett Square .....	260	260	
Toughkennamon .....	283	283	
Avondale .....	227	227	
West Grove .....	444	444	
Penn Station .....	506	506	
Elk View .....			
Lincoln University .....			
Oxford ( <i>b</i> ) .....			
Rising Sun .....			
Rowlandville .....			
Columbia & P. D. Junc. ( <i>c</i> ) CCLIV			

*a* With West Chester and Philada. R. R.    *b* With Peach Bottom R. R.

*c* On the Susquehanna River above Port Deposit.

*\*\* Peach Bottom R. R.*

STATIONS.			
Oxford Junction .....CCLII			
Hopewell .....			
Tweeddale .....			
Spruce Grove .....			
White Rock .....			
Kings Bridge .....			
Fairmount .....			
Fulton House.....			

**\*\*** See CCVI.—Levels of this road wanting.

*CCLIII. Philadelphia, Wilmington and Baltimore R. R.*

Levels of the P. W. & B. R. R. were copied from the profile in the office of the Company at Philadelphia. Assumed level 94 feet too high.

Datum: Ordinary *low* water at Philadelphia = Ocean level.

STATIONS.	Profile.	Corrected Tide.	
Philadelphia .....			
Southwark .....	101.40	7.40	
Third Street .....	120.55	26.55	
Sixth Street .....	126.78	32.78	
Seventh Street .....	127.58	33.58	
Tenth Street.....	126.26	32.26	
Twelfth Street.....	120.59	26.59	
Eighteenth Street .....	129.66	35.66	
Newport Street.....	137.53	43.53	
Greys Ferry Bridge.....	130.59	36.59	
Lazaretto .....	115.89	21.89	
Paschall .....			
Darby Street .....			
Sharon Hill .....			
Ridley Park. ....			
Chester Bridge ( <i>a</i> ) .....	118.33	24.33	
Lamokin Junc ( <i>b</i> ).....CCLII			
Thurlow .....	128.24	34.24	
Linwood.....	124.88	30.88	
Claymont .....	123.50	29.50	
Holly Oak .....	103.50	9.50	
Bellevue .....	108.07	14.07	
Wilmington .....LVI	101.11	7.11	
Delaware R. R. Junction .....			
Newport .....			
Staunton .....			

*a* Near Chester Station.

*b* Philadelphia and Baltimore Central R. R.

STATIONS.	Profile.	Assumed Elevation.	Corrected Tide.	
Newark .....	200.13	94	106.13	106
Iron Hill.....	216.70	94	122.70	123
Elkton .....	122.25	94	28.25	28
North East.....	137.75	94	43.75	44
Charlestown .....				
Perryville (c) .... CCLIV	115.48	94	21.48	21
Susquehanna (d) .....	110.34	94	16.34	16
Havre de Grace .....	110.12	94	16.12	16
Aberdeen.....	169.80	94	75.80	76
Perrymansville .....	136.39	94	42.39	42
Edgewood.....				
Magnolia .....				
Gunpowder Bridge.....	103.78	94	9.78	10
Chase's.....	114.40	94	20.40	20
Stemmer's Run .....				
Patapsco Neck.....	111.13	94	17.13	17
Bayview Junction (e) ..CC	129.92	94	35.92	36
Baltimore Dep't(f) CCLVI	103.33	94	9.33	9

c Port Deposit Branch R. R.

d Susquehanna River, north-east side.

e Northern Central Railway Junction.

f Baltimore and Ohio R. R.

#### CCLIV. Columbia and Port Deposit R. R.

Elevations on the Columbia and Port Deposit R. R., were copied from a profile furnished by Mr. J. B. Hutchinson, Chief Engineer.

Datum: Mean tide at Port Deposit, nearly = Ocean level.

STATIONS.	A. M. T.	Ocean Level.	
Perryville (a) ..... CCLIII		(21)	
Port Deposit.....	8	8	
P. & B. C. R. R. Junc. (b) CCLII	35	35	
Conominc Creek .....	70	70	
Ball Friar.....	77	77	
Ark Haven .....	79	79	
Peach Bottom (c) .....	98	98	
Fishing Creek .....	108	108	
Fights Eddy.....	118	118	
McCalls Ferry.....	168	168	
York Furnace .....	176	176	
Shank's Ferry.....	182	182	
Safe Harbor.....	197	197	
Wislar's Run.....	228	228	
Washington.....	231	231	
Columbia (d) .....	240	240	

a Philadelphia, Wilmington and Baltimore R. R.

b Junction with Baltimore Central R. R.

c Peach Bottom R. R. starts from the opposite side of the Susquehanna River. See table CCVI.

d The elevation is in the lower part of Columbia, and is about 4' lower than where the elevation is given on Pa. R. R. "Elevation on Pa. R. R. track in front of passenger station is 244'."



CCLV. *Western Maryland R. R.*

Elevations of the W. M. R. R., were copied from profile furnished through the kindness of Gen. J. M. Hood, President and Gen'l Manager of the road.

Datum: *Mean* tide at Baltimore = ? Ocean level.

STATIONS.	Tide.	Ocean Level.
Baltimore, Canton Wharf.....	20	20
B. & P. R. R. Crossing ( <i>a</i> )...CC	150	150
Oakland .....		
Arlington .....		
Mount Hope.....		
Howardville .....		
Pikesville .....		
Greenwood .....		
McDonough.....		
Junction.....		
Owing's Mills.....	480	480
Timber Grove.....		
Reisterstown.....	600	600
Glen Morris.....		
Finksburg.....		
Patapsco.....	360	360
Shamberger's .....		
Parrs Ridge.....	680	680
Tannery.....		
Westminster ( <i>b</i> ).....	680	680
Avondale .....		
Smith's Switch.....		
New Windsor .....	440	440
Linwood .....		
Union Bridge.....	350	350
Middleburg.....		
Frederick Junction ( <i>c</i> ) ...CCVII		
Double Pipe Creek.....		
Monocacy River.....	280	280
Rocky Ridge.....	370	370
Loy's .....		
Graceham.....		
Mechanicstown .....	475	475
Sabillasville .....		
Blue Ridge Summit ( <i>d</i> ) .....	1373	1373
Waynesborough .....		
Smithsburg.....		
Chewsville.....		
Antietam Creek.....	460	460
Cumbl'nd Valley Junc. ( <i>e</i> )CCVIII		
Hagerstown .....	520	520
Williamsport.....	305	305

*a* Baltimore and Potomac R. R. (or Northern Central) Crossing.

*b* Bachman's Valley R. R., no levels obtainable.

*c* Frederick Division of Penna. R. R. CCVII.

*d* Monterey Springs Summit.

*e* Cumberland Valley R. R. Level in table CCVIII is feet.

CCLVI. *Baltimore and Ohio R. R.*

Levels on the B. & O. R. R., were copied from a profile and notes in the office of the Company at Baltimore, by permission of Mr. W. N. Bolling, Engineer.

Datum: The levels are based upon mid tide at Baltimore, and are according to the original survey of the road by Mr. B. H. Latrobe, Chief Engineer, many years ago.

It was impossible to get the levels at all the stations on the road.

STATIONS.	Mean Tide.	Ocean Level.
Baltimore (Camden Station).....	24	24
Mount Clair.....	66	66
Winan's Station ( <i>a</i> ) .....CC		
Washington Junction ( <i>b</i> ).....		
Ellicotts Mills... ..	139	139
Elysville.....		
Woodstock.....		
Marriottsville.....		
Sykesville.....		
Parr's Ridge.....	813	813
Gaither.....		
Woodbine.....		
Mount Airy.....		
Monrovia.....		
Ijamsville.....		
Hartman's.....		
Frederick City Junc. ( <i>c</i> ) ...CCIX		
Monocay River.....	262	262
Frederick City.....	280	280
Doub's.....		
Point of Rocks ( <i>d</i> ).....	221	221
Berlin.....		
Knoxville ( <i>e</i> ).....		
Hagerstown Junction.....		
Sandy Hook.....		
Harpers Ferry ( <i>f</i> ).....	272	272
Duffield's.....		
Kearneysville.....		
Vancleaveville.....		
Martinsburg.....		
Shepardstown Road.....	467	467
North Mountain.....	547	547
Cherry Run.....	398	398

*a* Baltimore and Potomac R. R. Crossing.

*b* Washington Branch B. & O. R. R. diverges from main line at this point.

*c* Frederick Branch B. & O. R. R.

*d* Metropolitan Branch B. & O. R. R. connects with main line. *No levels of this line.*

*e* Washington County Division B. & O. R. R. joins main line at this point. *No levels of this line.*

*f* Winchester, Potomac & Strassburg R. R. connects with B. & O. R. R. This is one of the R. R's of the State of Virginia.

STATIONS.	Mean Tide.	Ocean Level.
Sleepy Creek.....		
Hancock.....(about)	424	424
Sir John's Run.....	434	434
Great Cacapon.....		
Willet's Run .....		
Rockwell's Run.....		
Doe Gully Tunnel .....	545	545
Little Cacapon.....	562	562
South Branch Potomac River....		
Green Spring Run .....		
Patterson's Creek.....	568	568
Cumberland ( <i>g</i> ).....CCLIX	639	639
Brady's Mill.....		
Rawlings.....		
Black Oak Bottom.....		
New Creek .....		
Piedmont .....(about)	919	919
Bloomington.....	993	993
Frankville .....		
Swanton.....		
Altamont.....	2620	2620
Deer Park.....		
Oakland .....		
Huttons.....		
Cranberry Summit.....	2550	2550
Rodermer's Tunnel.....		
Rowlesburg .....		
Cheat River.....	1397	1397
Cassady Summit.....	1856	1856
Kingwood Tunnel .....	1820	1820
Tunnelton.....		
Newburg.....		
Independence .....		
Raccoon Run.....	1227	1227
Thornton.....		
Grafton ( <i>h</i> ) .....	985	985
Fetterman .....		
Valley Falls.....		
Texas.....		
Benton's Ferry.....		
Fairmount.....	888	888
Barnesville .....		
Barrackville.....		
Farmington.....		
Mannington .....		
Glover's Gap.....	1150	1150
Glover's Gap Tunnel .....	1146	1146
Burton.....		
Littleton.....		

*g* Pittsburgh and Connellsville Branch of B. & O. R. R. intersects main line here.

*h* Parkersburg Branch B. & O. R. R. diverges from main line at this point.

STATIONS.	Mean Tide.	Ocean Level.	
Board Tree Tunnel .....	1104	1104	
North Fork of Fish Creek .....	887	887	
Bellton .....			
Welling Tunnel .....	1193	1193	
Cameron .....	1049	1049	
Easton's .....			
Roseby's Rock .....			
Moundsville ( <i>i</i> ) .....	661	661	
McMechen's Cut .....			
Benwood .....	648	648	
South Bank of Wheeling Creek } .....			
Wheeling, High Water ( <i>j</i> ) .....	637	(663)	

*i* Here the R. R. strikes the Ohio River bank and ascends hence to Bridgeport, opposite Wheeling; crosses by a bridge and continues west as Central Ohio Division of Baltimore and Ohio R. R.

*j* Wheeling.—Mr. J. T. Gardner, in his "Elevations of certain datum points," p. 655 of Hayden's Report of 1873, treats fully of the level of the Ohio River at Wheeling, in relation to the levels of the B. & O. R. R., and arrives at the "probable" conclusion that "the B. & O. R. R. results are too low," giving an improbable fall to the Ohio from Steubenville, exceeding 1 foot per mile, which is known to be its true rate of fall, from P. & S. R. R. and C. & P. R. R. surveys. High water at Wheeling is 637' by B. & O. R. R. survey of 1832, and the "channel" is 538. This is about 30' too low. Mr. Gardner makes Wheeling H. W. 1852. .... about 663

#### CCLVII. Cumberland and Pennsylvania R. R.

Levels on the C. & P. R. R. were furnished by Mr. James A. Millholland, Vice-President of the Company, Cumberland, Md.

STATIONS.	Above Tide.		
Cumberland ( <i>a</i> ) .....	650		
Eckert Branch Junction ( <i>b</i> ) .....			
Mount Savage Junction ( <i>c</i> ) .....			
C. & P. Junction ( <i>d</i> ) .....			
Barrelville .....			
Mount Savage .....	1206		
Frostburg .....	1920		
Neff Run .....			
Lonacoming .....	1560		
Barton .....			
Piedmont ( <i>e</i> ) .....	928		

*a* Baltimore and Ohio R. R.—Level of "Cumberland" in B. & O. R. R., Table CCLVI is 639, which, however, is Mr. Latrobe's original level.

*b* No levels.

*c* Bridgeport & Bedford R. R.

*d* Connellsville & Pittsburgh Branch B. & O. R. R.

*e* Rejoins the Baltimore & Ohio R. R.

NOTE.—This road runs back of the mountain, west of the river, through the Cumberland Coal Basin.

*CCLVIII. Cumberland Turnpike Road.*

Levels on the Cumberland Turnpike Road were copied from a report made by Jonathan Knight, Chief Engineer of the Baltimore and Ohio R. R., October 5th, 1835. They were partly taken from a map and profile made by James Schriver, in 1824. Mr. Knight says, in his report, "The levels may be sufficiently accurate for such a road (turnpike), yet are not so exact as levelings taken for a canal or railroad."

Datum: Probably mean tide at Baltimore.

NAMES OF TOWNS, &c.	Above Tide.
Cumberland.....CCLVI	635
Frostburg.....	1890
Great Savage Mountain Summit.....	2657
Savage River, 2 miles from its head.....	2376
Little Savage Mountain Summit.....	2535
Little Backbone Mountain Summit at (Beall's) Dividing Eastern and Western Waters.....	2372
Meadow Mountain Summit (Alleghany Mtn.)....	2654
Castelman's River.....	2077
Negro Mountain Summit.....	2826
Keyser's Ridge Summit, a spur of Negro Mountain.....	2843
Winding Ridge Summit.....	2534
Smythfield at Youghiogheny River.....	1405
Barren Hill Summit.....	2450
Woodcock Hill or Briery Mountain.....	2500
Laurel Hill or Most Western Mountain.....	2412
Munroe at Western Base of Laurel Hill.....	1065
Uniontown.....	952
Cauley's Hill.....	1274
Brownsville at Monongahela River.....	873
Hillsborough.....	1750
Washington.....	1406
West Alexandria.....	1797
Wheeling.....	748

*CCLIX. Pittsburgh and Connellsville R. R.*

Levels on the P. & C. Branch of the B. & O. R. R. were copied from the profile in the office of the Company at Connellsville, Fayette County, Pa.

Datum: As noted on the profile is 200' below low water at Pittsburgh, and 514' above mean tide; therefore 514' has been added to each elevation, as copied from the profile to get mean tide at Baltimore = ? ocean level.

STATIONS.	Assumed Elevation.	Mean Tide.
Cumberland (a).....CCLVI	124	638
Mt. Savage Jun. (b)(c)IX.CCLVII.	170	684

a With B. & O. R. R.

b Cumb. & Pa. R. R.

c Bedford & Bridgeport R. R.

STATIONS.	Assumed Elevation.	Mean Tide.	
Ellerslie.....	216	730	
Cook's Mills.....	270	784	
Bridgeport.....	424	938	
Fairhope.....	870.5	1385	
Southampton.....	104.5	1564	
Glencoe.....	1119	1633	
Philson's.....	1347	1861	
Sandpatch Tunnel.....	1712	2226	
Summit.....	1772	2286	
Myersdale ( <i>d</i> ).....CCLX	1549	2063	
Garrett ( <i>e</i> ).....CCLXI	1433.5	1948	
Pinegrove.....	1360	1874	
Mineral Point ( <i>f</i> ).....CCXII	1310.9	1825	
Castleman.....	1142.6	1757	
Pinkerton.....	1135	1649	
Shoo-Fly Tunnel.....	1100	1614	
Brook Tunnel.....	1044	1558	
Ursina ( <i>g</i> ).....			
Confluence.....	832	1346	
Draketown Run.....	805	1319	
Egypt.....	788	1302	
Ohio Pyle.....	723	1237	
Indian Creek.....	468	982	
Sand Works.....	407	921	
White Rock ( <i>h</i> ).....CCLXIII	407	921	
Connellsville ( <i>i</i> ).....CCLXVI	380	849	—
Broad Ford ( <i>j</i> ).....CCLYIV	358	872	
Sedgwick.....	354	868	
Dawson ( <i>k</i> ).....CCLXV	350	864	
Laurel Run.....	342	856	
Oakdale.....	338	852	
Layton.....	304	818	
Barring's.....	290	804	
Jacob's Creek.....	280	794	
Smith's Mill.....			
Port Royal.....	278	792	
Snyder's.....	274	788	
West Newton.....	268	782	
Sewickley ( <i>l</i> ).....XXXI		(780)	
Armstrong's.....	265	779	
Robbin's.....	254	768	
Coultersville.....	254	768	
Alpsville.....	254	768	
Osceola.....	254	768	

*d* Salisbury & Baltimore R. R. Junction.

*e* Buffalo Valley R. R.

*f* Somerset & Mineral Point R. R.

*g* Coal R. R.

*h* Fayette and Uniontown Branch R. R.

*i* S. W. Pa. R. R.

*j* Mt. Pleasant Branch.

*k* Hickman Run Branch R. R.

*l* Youghiogheny R. R., Branch of Pa. R. R. difference of 1' in levels at Sewickley.



STATIONS.	Assumed Elevation.	Mean Tide.	
Ellrod.....	254	768	
Long Run.....	251	765	
McKeesport.....	251	765	
Riverton.....	251	765	
Saltsburg.....	251	765	
Port Perry Junction .....	251	765	
Braddock's .....	255	769	
City Farm.....	247	761	
Salt Works.....	252	766	
Brown's.....	243	757	
Grove.....	270	784	
Hazelwood.....	275	789	
Frankstown .....	269	783	
Laughlin.....	256	770	
Copper Works.....	249	763	
Soho.....	255	769	
Birmingham Bridge.....	237	751	
Pittsburgh.....	237	751	

*CCLX. Salisbury R. R.*

Levels on the Salisbury R. R. were furnished by Mr. R. I. Batzer, C. E.

Datum : Pittsburgh and Connellsville R. R. at Meyersdale.

This road runs south up Castleman's River, towards the Maryland line.

STATIONS.	Mean Tide.		
Pitts. & Conn. R. R. Junction ( <i>a</i> )			
CCLIX .....	2095		
Meyersdale.....	2063		
Coal Mines ( <i>b</i> ).....	2067		
Romain.....	2073		
Keystone.....	2075		
Livengood's Mill.....	2100		
Salisbury .....	2131		
Coal Mines ( <i>c</i> ).....	2331		

*a* Junction with Pittsburgh and Connellsville R. R. near Meyersdale, or Myer's Mills.

*b* Cumberland and Elklich Coal Mines.

*c* Salisbury and Baltimore Coal Mines.

*CCLXI. Buffalo Valley R. R.*

Elevations on the Buffalo Valley R. R. were furnished by Mr. S. Philson, President of the Company.

Datum : Pittsburgh and Connellsville R. R.

This road runs north into Somerset County.

STATIONS.	Mean Tide.		
Garrett (a).....CCLIX	1947		
Burkholder.....	1992		
Beaghley's.....	2010		
Bitner.....	2044		
Pine Hill.....	2064		
Hanger's.....	2073		
Berlin.....	2176		

*CCLXII. Somerset R. R.*

NOTE.—The records of this road were destroyed by fire. It runs north into Somerset County towards Johnstown.

*CCLXIII. Fayette Branch, P. & C. R. R.*

Levels on this Branch of the Pittsburgh and Connellsville R. R. were copied from a profile in the office of the Company at Connellsville, Pa., through the kindness of Mr. W. H. Taylor, Resident Engineer.

Datum: Mean tide at Baltimore, Md.

This road runs southwest along the west foot of Chestnut Ridge towards the Virginia State line.

STATIONS.	Mean Tide.		
White Rock (a).....CCLIX	907		
Fayette.....	924		
Watt's.....	991		
Dunbar.....	1011		
Ferguson.....	1138		
Mt. Braddock.....	1175		
Lemont's.....	1084		
Evans'.....	1009		
Hoggsett's.....	978		
Uniontown.....	981		

*a* Junction with Pittsburgh & Connellsville R. R. just above Connellsville.

NOTE.—The other bridge (at Connellsville) carries the southwest Pennsylvania R. R., which also runs up Dunbar Creek to Uniontown.

*CCLXIV. Mt. Pleasant Branch, P. & C. R. R.*

Data obtained as the last mentioned.

This road runs northeast along the west foot of Chestnut Ridge.

STATIONS.	Mean Tide.		
Broad Ford ( <i>a</i> ).....CCLIX	873		
Morgan's.....	944		
Tinstman's.....	1076		
Valley Coal Mines.....	1035		
Fountain Mills.....	1040		
West Overton.....	1045		
Iron Bridge.....	1052		
Stauffer's.....	1057		
Mt. Pleasant.....	1086		
End of Road.....	1083		

*a* Junction with Pittsburgh and Connellsville R. R. at Broad Ford, 3.2 miles below Connellsville.

*CCLXV. Hickman's Run Branch, P. & C. R. R.*

Data as above.

This road, one mile long, runs north to Coke Banks.

STATIONS.	Above Tide.		
Dawson Junction ( <i>a</i> ).....CCLIX	872		
Terminus of Road.....	1006		

*a* Junction with Pittsburgh and Connellsville R. R. near Dawson.

*CCLXVI. Southwest Pennsylvania Extension.*

Levels on the Extension of Southwest Penna. R. R. were furnished by Mr. John C. Oliphant, Engineer.

Datum is *high tide* in Schuylkill River, at Philadelphia. Add 7' for ocean level. For the surveys an artificial datum was assumed, as shown in column 1. Column 2 gives this corrected for high tide at Philadelphia. Column 3 corrected for ocean level.

The main road is given in the I series, Table XXX.

This road crosses the Youghiogheny at Connellsville, and keeps up Dunbar Creek over to Uniontown, parallel with the Fayette County Branch of the P. & C. R. R. See Table CCLXIII.

STATIONS.	Assumed Elevation.	Above Tide.	Ocean Level.
Connellsville ( <i>a</i> ).....CCLIX	159.5	908	915
Sub-grade, Pier No. 1.....	153.6	902	909
Ordinary Water in Youghiogheny River, at R. R. Bridge, S. W. Penna. R. R.....	118	866	873

*a* Crosses *above* P. & C. R. R. here on a Bridge.

STATIONS.	Assumed Elevation.	Above Tide.	Ocean Level.
New Haven .....	138	886	893
Wheelerville.....	144	892	899
Dunbar .....	246.4	995	1002
Ferguson.....	376.2	1125	1132
Mt. Braddock ( <i>b</i> ).....	448	1196	1203
Lemont .....	274.8	1023	1030
Hoggsett's Mill.....	205.7	954	961
Uniontown ( <i>c</i> ).....	234.2	983	990

*b* Deep Cut; original surface  $485 + 748.5 = 1233.5$

*c* Intersection of Main Street and Broadway.

### CCLXVII. *Youghiogheny Coal Mine Levels.*

Elevations of *Coal openings* on the line of Youghiogheny R. R. furnished by Mr. I. F. Wolf, Engineer Penn Gas Coal Company.

Datum: That of the Pa. R. R.

Youghiogheny Mine, No. 1 .....	720.40
" " " 2.....	776.40
" " " 4.....	800.40
Th. Moore's drift at Moore's station P. & C. R. R.....	793.40
Markel's Drift at Junction of Yough. R. R. ....	824.44

### CCLXVIII. *Westmoreland Levels.*

Various datum points in Westmoreland County, Pennsylvania, from a survey made by Mr. F. Z. Shellenberg, Superintendent of the Westmoreland Coal Company, Irwin's Station, Penna. R. R.

Datum: That of the Pennsylvania R. R. (Add 7' for Ocean Level.)

Long Run Presbyterian Church Bench Mark on Door Sill.....	+ 1150'
Circleville Intersection of Mount Pleasant Turnpike with Greensburg and Pittsburgh Turnpike .....	1223
Jacksonville, Turnpike east end of town .....	1152
South Side Mine Mouth Coal.....	898
Larimer's Coal Mine .....	961
Ray's Coal Bank; on farm of William Ray's heirs .....	1052
Robinson's Coal Bank; on farm of R. S. Robinson .....	989
Bigley's Mines; Mouth of Drain, entry from Armstrong's Osceola Works, P. & C. R. R., at head of Bigley's Main Entry .....	902
Coal Hollow: Youghiogheny Coal Hollow Coal Company's Mines, be- tween Guffey's and Shaner's Station, P. & C. R. R. Coal .....	789
Armstrong's Coal, opposite Buena Vista (east).....	813
Moore's Coal Mine .....	812
Suter's Station, P. & C. R. R. Coal .....	843
Westmoreland Coal Shaft (Coal?) .....	751
Foster Shaft (Penn Township). Coal .....	935
Penn Coal Mine, north side of Penn Station, Pa. R. R. ....	927
Kifer's Coal Bank, east of Penn Station, north side of Pa. R. R. ....	1140
Smith's Coal Bank .....	1180
Loughner's Coal Bank .....	1102

Harrison City, two miles north of Manor Station, on Pa. R. R., on bridge over Brushy Run . . . . .	967
Cross Roads, two miles west of Harrison City . . . . .	1185
Salem: Intersection of Freeport and Saltzburg Roads, northeast of Salem. Salem: Burnt Cabin Summit, between Allegheny and Monongahela Waters, between Beaver Run and Turtle Creek, one-half mile northeast of Salem. . . . .	1231
Salem Cross Roads (Delmont P. O.). . . . .	1200
Salem: Coal at Salem Cross Roads. . . . .	1255
Bouquet Village Road, opposite Grist Mill. . . . .	1272
Bouquet Coal. . . . .	1102
William Duff's Steam Grist Mill, surface of water just below Mill. . .	1104
King's Bank, Coal at Burnt Cabin Summit. . . . .	950
McQuade's Coal Bank on road leading from Salem Cross Roads to Freeport. . . . .	1203
John Cochran's Coal Bank. . . . .	1189
Thorn Run: Water in Run at road crossing Jas. Cochran's farm. . . .	1132
Turtle Creek: Water in Creek at northern turnpike crossing, on Wau- gaman's farm. . . . .	1080
Turtle Creek: Northern turnpike crossing, at Long's. . . . .	1051
Turtle Creek: Water in Creek at Remaly's Mill. . . . .	995
Walton's Summit, between waters of Turtle Creek and Brushy Run .	950
Longacre's Summit . . . . .	1194
Brinker's Summit . . . . .	1187
Fink's Run: Water at junction with Brushy Run, four miles north of Manor Station, Pa. R. R. . . . .	1202
	1000

*CCLXIX. Pittsburgh, Virginia and Charleston R. R.*

Levels on the P. V. & C. R. R. were copied from the profile in the office of the company at Pittsburgh, by permission of I. M. Byers, Esq., Superintendent.

Datum:

This road ascends the west bank of the Monongahela River from Pittsburgh to the Virginia State Line, and is in process of completion above Monongahela City. It crosses the river from Pittsburgh to Birmingham on a high bridge.

STATIONS.	Above Tide.	Ocean Level.
Pittsburgh (a).....CCCLII	750	
12th Street, Birmingham.....	786	
18th " ".....	779	
22nd " ".....	770	
30th " ".....	745	
Beck's Run.....	750	
Bird's Run.....	749	
Street's Run.....	745	
West's Run.....	740	
Homestead.....	745	
Patterson's Run.....	742	
Opposite Braddock's.....	730	
Thompson's.....	749	
Opposite McKeesport.....	725	
Curry's Run (b).....	734	

a Junction with the Pittsburgh, Cincinnati and St. Louis R. R.

b On bridge.

STATIONS.	Above Tide.	Ocean Level.	
Camden.....	738		
Rock Run.....	731		
Pine Run.....	739		
Peter's Creek.....	735		
Wylie's.....	743		
Elizabeth.....	731		
Walton's.....	741		
Hodgen's Coal Road.....	735		
Coal Bluff Road.....	735		
Houston's Run.....	740		
Buffalo Coal Works.....	748		
Mingo Creek.....	740		
Dry Run.....	735		
Monongahela City.....	737		
Pigeon Creek (c).....	735		
Johnson's Coal Road.....	750		
Pike Run.....	719		
West Brownsville (d).....	758		

c Surface of water at ordinary stage 709.

d In Street in front of Hotel.

## VII. ALLEGHENY SERIES.

### CCC. Pittsburgh City Levels.

Elevations at different points in the City of Pittsburgh, Pa., were furnished by Mr. William Martin, Assistant Engineer.

Datum: *Low water in the Allegheny River at the Suspension Bridge*, which according to Mr. Jas. T. Gardner's determination, is 699.20' above the Mean Surface of the Atlantic Ocean. See page 655, Vol. I, Hayden's Geological Survey Report of 1873.

#### *Elevation of Points in City of Pittsburgh, Pa.*

BENCH MARKS.	City Datum.	Ocean Level.	
On Window-sill of Monongahela Incline Plane, Check House..	407.075	1106.275	
On Belt-course of Union Depot, Main Entrance.....	47.203	746.403	
On East end Door-sill of Point Breeze Hotel at Intersection of Penn and Fifth Avenue..	273.814	973.014	
On Belt-course of Munshall's Distillery, corner Penn Avenue and Water Street.....	28.198	727.398	
On Door-sill of Post Office.....	51.554	750.754	
On Embankment of <i>Lower</i> (old) Reservoir on Bedford Avenue	165.854	865.044	
On Embankment of <i>Upper</i> (old) Reservoir, Bedford Avenue..	401.674	1100.874	



BENCH MARKS.	City Datum.	Ocean Level.	
On Flow Line of Highland Avenue (new) Reservoir.....	365	1064.20	
On Flow Line of Herron Hill (new) Reservoir.....	560	1259.20	
On Flow Line of Brilliant Hill (new) Reservoir.....	235	934.20	

### CCCI. Allegheny Valley R. R.

Levels on the Allegheny Valley R. R., from Kittaning to Oil City, were copied from notes in possession of Mr. Wainwright, Assistant Engineer, Engineer's Office, Allegheny Valley R. R., Pittsburgh, Pa.

This portion of the road was leveled during the summer of 1875. The elevation at Kittaning was assumed to be 500' above tide. The difference between the true elevation and the elevation assumed at the Red Bank intersection of the Bennett's Branch R. R. with the main line, was made to be 284'. This must be incorrect.

Great difficulty has been experienced in connecting the levels of this road with those of others in Northwestern Pennsylvania, and no reliance can be placed upon their exactness. They are evidently *too low*, and the error seems to be in the 284' feet difference; and therefore in the Bennett's Branch Extension Table, CCCII.

For instance, the level at Parker's City is, by this Allegheny Valley R. R. Table,  $579.2 + 284 = 863'$ ; whereas, Mr. Lucas makes it 909', or 46 feet higher. See Section in Carll's Report of Progress, 1874.

Again, at Franklin this Table gives  $678.5 + 284 = 963'$ ; whereas, Lake Shore and Michigan Southern (Franklin Division) Table CCCLXII makes it 444.06 (+ Lake Erie) + 573 = 1017', or 54 feet higher.

Again, at Oil City this Table gives 983'; whereas Oil Creek and Allegheny Valley R. R. (CCCIIV) gives 995', or 12' higher. And the same in CCCLXXXVII by the Franklin Branch of Atlantic and Great Western.

The levels of points from Pittsburgh up to Kittaning could not be obtained by any efforts. There seem to be no records, profiles or notes of the levels of this part of the line. Pittsburgh is 745' by Table I; Gardner makes it 746', and so does Pittsburgh, Fort Wayne and Chicago R. R., Table CCLXXXIII.

STATIONS.	Assumed	Tide.	Ocean Level.	
Pittsburgh.....			(745)	
Sharpsburgh.....				
Hulton.....				
Logan's Ferry.....				
Parnassus.....				
Tarentum.....				
Chartiers.....				
Soda Works.....				
West Penn Junction (a) XXVI.....			(778)	
White Rock.....				

a With West Penn. R. R. east to Philadelphia.

STATIONS.	Assumed	Tide.	Ocean Level.
Kelly's.....			
Logansport.....			
Rosston.....			
Kittaning.....	500	784	791
Cowanshannock.....	498.8	783	790
Pine Creek.....	502.2	786	793
Templeton.....	513.9	798	805
Mahoning.....	514.4	799	806
Reimerton.....	526.8	812	819
Red Bank Junc. (b) CCCII	540.9	825	832
Phillipsburg.....	545.3	829	836
Brady's Bend.....	546.4	831	838
Catfish.....	548.5	833	840
Sarah Furnace.....	551.5	836	843
Hillsville.....	555.3	839	846
Monterey.....	564.7	849	856
Parker City (c)... CCCIII	579.2	863	870
Foxburg.....	586	870	877
Emlinton.....	595.2	879	886
Dotterer's.....	604.9	889	896
Black's.....	612.6	897	904
Rockland.....	616.6	901	908
St. George's.....	624.9	909	916
Scrub Grass.....	637.7	922	929
Brandon's.....	651.4	936	943
Foster.....	659.8	944	951
East Sandy.....	665.4	950	957
Cochran.....	672.5	957	964
Franklin (d) } CCCLXV	678.5	963	970
} CCCLXII			
† Oil City (e)... CCCIV	699.2	983	990

b Junction of Bennett's Branch R. R. Elevation according to profile of Bennett's Branch Ext. of Allegheny Valley R. R. + 821.70, which gives the above mentioned difference of 284', used for reducing the other levels to tide. This however depends on the Phila. & Erie R. R. levels, Table , which are as unreliable as those of the Allegheny Valley R. R. The connection between Harrisburg and Pittsburgh, round by the West Branch Susquehanna River, is divisible into three sections, the middle one (Bennett's Branch Extension R.R.) alone being reliable.

c Junction with Parker and Karn's City R. R.

d Junction with Atlantic and Great Western R. R., and with Lake Shore and Michigan Southern (Franklin Division) R. R.

e South Oil City, river rail, main track, opposite lower end of platform of depot. Junction with Oil City and Allegheny Valley R. R.

NOTE.--Seven feet has been added to the second column in the above Table to make the third column agree with levels in Table CCCII.

### CCCII. Bennett's Branch Extension R. R.

The levels on the Bennett's Branch Extension, A. V. R. R., were copied from the profile in the office of the A. V. R. R. at Pittsburgh, Pa., through kindness of Mr. H. Blackstone, Chief Engineer.

Datum : Tide water at Philadelphia.

This datum, however, is dependent upon the level of the eastern terminus or Driftwood Junction with the Phil. & Erie R. R. But this is known to be too low, and therefore, the levels of the whole line are too low, and carry down with them those of the Allegheny Valley Main Line, as stated in notes, to Table CCCL.

Mr. Burgin's original level on the P. & E. R. R. at Driftwood was 788'. This Mr. Wilson took for his datum level in the surveys of the Bennett's Branch Extension R. R. across to the Allegheny Valley R. R. Mr. Wilson's levels are given in column 1.

On the profile of the P. & E. R. R. used in Table CCXVI, the level of the point of junction is called 795 (7 feet higher). Column 2 makes this first correction, which helps to lift the Allegheny Valley levels a little, but not near enough.

Column 3 is left blank for a future correction, when the levels of the P. & E. R. R. are lifted, as they must be; for, although they start about right at Sunbury, they are already about 20 feet too low at Williamsport by the Catawissa R. R. (LXV), and by the Northern Central R. R. (CC) lists of levels; and feet too low at Lock Haven by the Pennsylvania R. R. (XV) branch lists. At Emporium also they are 18 feet lower than the Buffalo, N. Y. & Phil. Railroad (CCXIX).

But even this 20 feet added to the previous 7' = 27' will not suffice to lift the west end of this Bennett's Br. Ext. R. R. high enough to cancel the difference at Franklin and Oil City. It is probable, however, that the whole residual error lies on the Allegheny Valley R. R. line.

STATIONS.	Above Tide.	Above Tide.	Corrected Tide.	Ocean Level.
Driftwood Junction ( <i>a</i> )				
CCXVI.....	788	795		
Mix Run.....	848	855		
Miller's.....	880	887		
Dent's Run.....	898	905		
Enz.....	938	945		
Grant.....	949	956		
Mount Pleasant.....	973	980		
Devil's Elbow.....	993	1000		
Benezette.....	1014	1021		
Meadic's Run ( <i>b</i> ).....	1073	1080		
Caledonia Tunnel ( <i>c</i> )....	1122	1129		
Slabtown Dam.....	1163	1170		
Hebner's Run.....	1245	1252		
Clear Run.....	1385	1392		
Slab Run.....	1381	1388		
Fall's Creek.....	1381	1388		
Crooked Run.....	1378	1385		
Evergreen.....	1374	1381		
Maghee's.....	1361	1368		
Panther's Run ( <i>d</i> ).....	1362	1369		
Reynoldsville.....	1351	1358		
Prior Run ( <i>e</i> ).....	1342	1349		
Prindible's.....	1335	1342		

*a* With P. & E. R. R. near Driftwood. "795" on P. & E. profile.

*b* Bench mark on Bridge; West abutment, top of Cap-stone, N. E. corner.

*c* 250' east of Tunnel.

*d* Cap-stone of east Abutment.

*e* Cap-stone of east Abutment.

STATIONS.	Above Tide.	Above Tide.	Corrected Tide.	Ocean Level.
McAnnutt Run ( <i>f</i> )....	1335	1342		
Camp Run.....	1317	1324		
Fuller's Mill.....	1301	1308		
Wolf Run.....	1295	1302		
Cable Run.....	1285	1292		
Iowa Mill.....	1273	1280		
Gooseneck.....	1256	1263		
Bell's Mill.....	1340	1347		
Garrison's Mill.....	1235	1242		
Brookville.....	1209	1216		
Nicholson's Mill.....	1199	1206		
Corder's Run.....	1200	1207		
Puckerty Point.....	1189	1196		
Rattlesnake Run.....	1183	1190		
Baxter's Mill.....	1181	1188		
Heathville.....	1137	1144		
Motter's Run.....	1124	1231		
Bear Tree Run.....	1107	1114		
Maysville.....	1082	1089		
Pine Run.....	1075	1082		
Millville.....	1067	1074		
Indiantown Run.....	1063	1070		
Middle Run.....	1060	1067		
New Bethlehem.....	1054	1061		
Anthony's Neck.....	1025	1032		
Leatherwood.....	1001	1008		
Rock Run.....	940	947		
Buck Lick Run.....	913	920		
Lawsonham ( <i>g</i> ).....	893	900		
Fiddler's Run.....	889	896		
Red Bank Jun. ( <i>h</i> ) CCCI	825	832		

*Sligo Branch of A. V. R. R.*

Lawsonham ( <i>i</i> )...CCCH	891	898		
Stop's Run.....	913	920		
Fiddler's Run ( <i>j</i> ).....	966	973		
9000 feet ( <i>k</i> ).....	1043	1050		
14,000 feet.....	1141	1148		
15,000 feet.....	1161	1168		
17,000 feet.....	1202	1209		
23,000 feet.....	1325	1332		
Benn's Summit.....	1368	1375		
29,000 feet.....	1305	1312		
Cherry Run.....	1198	1205		

*f* Cap-stone of west Abutment.

*g* Sligo Branch R. R.

*h* With Allegheny Valley R. R.

*i* Junction.

*j* First crossing; centre of Trestle.

*k* From the Junction.

STATIONS.	Above Tide.	Above Tide.	Corrected Tide.	Ocean Level.
38,000 feet.....	1218	1225		
Sligo Summit.....	1300	1307		
Iron Ore Bank.....	1228	1235		
52,000 feet.....	1150	1157		
Little Licking Creek....	1122	1129		
Big Licking Breck.....	1102	1109		
Sligo ( <i>l</i> ).....	1090	1097		
End of Road.....	1085	1092		

*Boston Branch of A. V. R. R.*

Junction ( <i>m</i> ).....CCCCII	1049	1056		
Bridge.....	1050	1057		
2,000 feet.....	1075	1082		
3,000 feet.....	1097	1104		
4,000 feet.....	1118	1125		
5,000 feet.....	1138	1145		
6,000 feet.....	1161	1168		

7 Sligo Furnace is served by this road.

*m* There are no stations marked on the profile of this branch. The levels are given at thousand feet from the point of divergence from the main road.

*CCCCIII. Parker and Karns City R. R.*

Levels of the Parker and Karns City R. R. were taken from notes in possession of Mr. Wm. M. Kipp, Engineer at Parker City. The datum of the preliminary survey was an assumed level 100 feet below the top of the west abutment of the iron bridge then building. This datum (as shown by subsequent surveys in locating the line) is 103.99' below the top of the free-stone base of the toll house. The bridge rises 8' going east, and there is a further rise from the end of the bridge to the A. V. R. R. depot of 1.98', as ascertained by Mr. J. F. Carll, which will make the datum of P. & K. C. R. R. below the A. V. R. R. depot  $103.99 + 8 + 1.98 = 113.97'$ . Elevation A. V. R. R. depot, Parker City  $863 - 114 = 749 =$  datum which added to the elevations as copied from notes should bring levels to tide.

STATIONS.	Above Tide.	Above Tide.	Ocean Level.	
Parker Junc. ( <i>a</i> )..CCCCI		863	870	
Stone House.....	315	1064	1071	
Martinsburg.....	330	1079	1086	
Argyle.....	386.80	1136	1143	
Petrolia.....	401	1150	1157	
Central Point.....	410	1159	1166	
Karns City.....	430.33	1179	1186	

*a* With Allegheny Valley R. R.

NOTE.—Seven feet has been added to the second column in the above Table to make the third column agree with Tables CCCI and CCCII.



## CCCIV. Oil Creek and Allegheny River R. R.

Levels on the Oil Creek and Allegheny River R. R. were copied from the profile in the office of the Company, at Oil City, by permission of C. J. Hepburn, Esq., Superintendent.

Datum: P. & E. R. R.

STATIONS.	Above Tide.	Ocean Level.
Irvinton ( <i>a</i> ).....CCXV	1158	
Dunn's Eddy.....	1144	
Penna. House.....	1140	
Thompson's.....	1130	
Cobham.....	1121	
Magee.....	1118	
Tidioute.....	1099	
Trunkeyville.....	1085	
Hickory.....	1078	
Dawson.....	1063	
Jamison.....	1060	
Tionesta.....	1047	
Hunter.....	1048	
Stewart.....	1034	
President.....	1035	
Eagle Rock.....	1033	
Henry's Bend.....	1022	
Oleopolis.....	1019	
Walnut Bend.....	1010	
Rockwood.....	1003	
Imperial.....	995	
Oil City.....CCCLXVII	995	
McClintock.....	1045	
Rouseville.....	1026	
Rynd Farm.....	1030	
Tarr Farm.....	1049	
Columbia.....	1054	
Petroleum Centre.....	1076	
Boyd Farm.....	1073	
Pioneer.....	1086	
Shaffer.....	1120	
Miller's Farm.....	1118	
Titusville.....CCCVIII	1181	
Hydetown.....	1239	
Bridge ( <i>b</i> ).....	1241	
Gray's Mills ( <i>c</i> ).....CCCVII	1266	
Meyer's Switch.....	1230	
Tryonville.....	1305	
Centreville.....	1284	
Glynden.....	1335	
Spartansburg.....	1444	
Summit.....	1634	
Stewart's Switch.....	1460	
A. & G. W. R. R. Crossing CCCLXV	1433	
Corry ( <i>d</i> ).....CCXV	1420	

*a* Junction with P. & E. R. R.

*b* Near Hydetown.

*c* Union and Titusville R. R. Junction

*d* Junction with P. & E. R. R.



*CCCV. Pithole Valley R. R.*

Levels on the Pithole Valley R. R. were furnished by Mr. Aug. Mordecai, Assistant Engineer A. & G. W. R. R. at Meadville, Pa.

STATIONS.	Above Oleopolis	+ Lake Erie	Ocean Level.
Oleopolis.....CCCIV	0	446	1019
Wood's Mills.....			
Prather.....	232	678	1251
Pit hole City.....	290	736	1309
Pleasantville.....	615	1061	1634
Enterprise.....	242	688	1261
Titusville.....CCCVI	162	608	1181

*CCCVI. Dunkirk, Allegheny Valley and Pittsburgh R. R.*

Levels on the Dunkirk, Allegheny Valley and Pittsburgh R. R., were copied from a list furnished by Mr. Henry E. Wrigley, C. E., who obtained the levels from the Engineer in charge of the road.

Datum: Lake Erie.

STATIONS.	+ Lake Erie	Ocean Level.
Titusville.....CCCIV	608	1181
East Titusville.....		
Pleasant Valley.....	755	1328
Grand Valley.....		
Star.....	785	1358
Newton.....	825	1398
Summit.....	878	1451
Garland.....	695	1268
Pittsfield.....	648	1221
Youngsville.....	611	1184
Irvineton.....	575	1148
Gravel Pit.....	595	1168
Jackson.....	603	1176
Warren.....	620	1193
North Warren.....	643	1216
Russelburg.....	660	1233
Ackley's.....	663	1236
Fentonville (a).....	670	1243
Frewsburg.....	688	1261
A. & G. W. R. R. Crossing CCCLXV	689	1262
Falconer.....	685	1258
Ross Mill.....	689	1262
Vermont.....	722	1295
Sinclairville.....	757	1330

*a* State Line of Pennsylvania and New York.

*b* Surface of water outlet of Chataqua Lake 675 + Lake Erie 573 = 1248' Ocean Level.

STATIONS.	+ Lake Erie	Ocean Level.
Moons.....	730	1303
Cassadago (c).....	736	1309
Skidmore.....	744	1317
Norton's.....	425	998
Laona.....	239	810
Fredonia.....	192	765
Dunkirk (d) .CCCLXIII, CLXII	25	598

c Surface of water 732 + Lake Erie 573 = 1305' Ocean Level.

d On the list from which the above levels were copied, no elevation was noted at Dunkirk, but as the D. A. V. & P. R. R. and the L. S. & M. S. R. R. use the same depot, the tracks being on the same level, and the elevation as given on profile of L. S. & M. S. R. R. taken as correct, it is therefore adopted as the elevation, at the terminus of this road.

#### CCCVII. Union and Titusville R. R.

Levels on the Union and Titusville R. R. were furnished through the courtesy of Mr. C. J. Hephurn, Supt. Oil Creek and Allegheny River R. R.

Datum: P. & E. R. R.

STATIONS.	Tide.	Ocean Level.
O. C. & A. R. R. R. Junc. (a) .CCCIV	1266	
Hydetown.....	1239	
Myer's Switch.....	1230	
Tryonville.....	1305	
Noble.....	1285	
Riceville.....	1356	
Lincolntown.....	1369	
Lakeville.....	1399	
Bloomfield.....	1396	
Union (b).....CCXV	1257	

a Junction with Oil Creek and Allegheny River R. R. at Titusville.

b Junction with Phila. and Erie R. R.

#### CCCVIII. Pennsylvania and Petroleum R. R.

Levels on the Pennsylvania and Petroleum R. R. were furnished by Mr. Aug. Mordecai, Asst. Eng. A. & G. W. R. R., Meadville, Pa.

Datum: Lake Erie.

STATIONS.	+ Lake Erie	Ocean Level.
Titusville.....CCCIV; CCCV	608	1181
Newton's Mills.....	685	1258
Athens Mills.....	693	1266
Little Cooley.....	630	1203
Teeple Town.....	631	1204
Cambridge.....	585	1158
Edinboro.....	639	1212
Summit.....	705	1278
McKean's Corner.....	480	1053
Erie.....CCCLXIV		

NOTE.—The above levels are from the preliminary survey. The road is not yet built, but the proposed line is from Titusville to Erie.

CCCLIX. (a) *Buffalo, Corry and Pittsburgh R. R.*

Levels on the Buffalo, Corry and Pittsburgh R. R. were obtained in Oil City, through kindness of Mr. C. I. Hepburn, Supt. O. C. & A. R. R. R.

STATIONS.	Above Tide.		
Corry Junction..CCXV, CCCIV, CCCLXV.....	1423		
Childs.....	1474		
State Line.....	1417		
Clymer .....	1146		
Panama.....	1545		
Sherman .....	1568		
Summerdale.....	1629		
Mayville.....	1300		
Prospect.....	1221		
Brockton (b).....CCCLXIII	672		

α The levels on this road are supposed to be correct, and may be entirely so, but the profile from which the elevations were copied is indefinite as to the exact location of the stations.

β Junction with L. S. & M. S. R. R. Elevation on L. S. & M. S. R. R. at this point is 724' above Mean Surface of Atlantic Ocean.

## VIII. OHIO LINE SERIES.

CCCL. *Pittsburgh, Cincinnati and St. Louis R. R.*

Levels of the Pittsburgh, Cincinnati & St. Louis Railroad, were copied from profile in the office of the Company at Pittsburgh, Pa. The profile was furnished by Mr. S. M. Felton, Jr., Gen'l Supt.

Datum: Pennsylvania R. R. levels? Add 7' for Ocean level.

STATIONS.	Mean Tide.	Ocean Level.	
Pittsburgh (a).....I	(738)	(745)	
Birmingham (b).....	760	767	
Jones' Ferry.....	75 7	764	
Temperanceville.....	762	769	
Sheridan ... ..	864	871	
Cork Run.....	874	881	
Ingram .....	880	887	
Broadhead.....	872	879	
Cemetery Crossing.....	867	874	
Bridge, No. 3.....	824	831	
Bridge, No. 4.....	787	794	
Bridge, No. 5.....	775	782	
Mansfield (c).....CCCLI	775	782	
Walker's Mill.....	820	827	
Oakdale.....	908	915	
Noblestown.....	923	930	
Willow Grove.....	988	995	

STATIONS.	Mean Tide.	Ocean Level.	
McDonald's .....	991	998	
Primrose .....	1023	1030	
Bulger .....	1146	1153	
Bridge, No. 17 .....	1232	1229	
Burgettstown .....	1001	1008	
Dinsmore .....	1082	1089	
Bridge, No. 19 .....	875	882	
Paris Road .....	858	865	
Bridge, No. 22 .....	829	836	
Collier's ( <i>d</i> ) .....	826	833	
Holliday Cove .....			
Edgington ( <i>e</i> ) .....			
Steubenville ( <i>f</i> ) ..... CCCLV			

*a* Pittsburgh Union Depot (746', Gardner.)

*b* South side of Ohio River.

*c* Junction with Chartier's R. R.

*d* In Virginia.

*e* East side of Ohio River.

*f* West side of Ohio River and junction with Cleveland and Pittsburgh River Division R. R.

The levels of this road through Ohio are given on page 670, Vol. 1, Ohio Geological Survey, 1873; beginning with Steubenville, Washington Street = 155'.

#### CCCLI. Chartiers R. R.

Elevations on the Chartier's Branch R. R., were furnished by Mr. N. I. Becker, Chief Engineer, P. C. & St. L. Railway, Columbus, Ohio.

Add 7' to reduce to Ocean level, and subtract 1' for the discrepancy at Mansfield, = 6'.

STATIONS.	Mean Tide.	Ocean Level.	
Mansfield ( <i>a</i> ) ..... CCCL	776	782	
Leasdale .....	802	808	
Woodville .....	807	813	
Bridgeville .....	825	831	
Boyce's .....	868	874	
Hill's .....	873	879	
Greer's .....	896	902	
Van Emmau's .....	925	931	
Cannonsburg .....	936	942	
Houston's .....	952	958	
Ewing's Mills .....	981	987	
Cook's .....	1006	1012	
Washington .....	1049	1055	

*a* Junction with Pittsburgh, Cincinnati and St. Louis R. R. In table CCCLXXII 775'.

*CCCLII. Hempfield R. R.*

Elevations on the Hempfield Railway, were furnished by Mr. W. N. Bolling, Engineer B. & O. R. R.

Datum: Mean tide at Baltimore, Md., equal Ocean level. (No connection can be made at Washington between the Hempfield and Chartier's R. R. lines.)

STATIONS.	Mean Tide.	Ocean Level.	
Washington (a)..... CCCLI	(1049)	(1055)	
Thompson's Mills.....	699	699	
Chartier.....			
Taylorsville.....	1008	1008	
Claysville.....	683 (?)	683(?)	
Vienna.....			
West Alexandria.....	1099	1099	
Valley Grove.....			
Point Mills.....	896	896	
Roney's Point.....			
Triadelphia.....	734	734	
Elm Grove.....	683	683	
Carbon.....			
Mt. De Chantel.....	674	674	
Wheeling (b).....	644	644	

a Continuation of the Chartier's R. R.

b North and Water Streets 644'. Market Place 662'.

*CCCLIII. Pittsburgh, Fort Wayne and Chicago R. R.*

Levels of Pittsburgh, Fort Wayne and Chicago R. R., were copied from the profile (in the office at Pittsburgh), furnished through the kindness of Mr. F. S. Slataper, Chief Engineer.

Datum: Lake Erie. Accepted level of Lake Erie above Ocean level is 573'.

The third column adds 1' to reduce the levels of the second columns to harmony with those of the Pennsylvania R. R.

It is thus seen that the Depot at Pittsburgh is established from the Atlantic side and from the Lake Erie side, with a probable error of about one foot.

STATIONS.	+ Lake Erie	Ocean Level.	Ocean Level.
Pittsburgh (a)..... I	173.10	746	745
Allegheny.....	165.82	739	738
Outer Depot.....	191.85	765	764
Wood's Run.....	158.65	732	731
Jack's Run.....	156.50	729	728
Bellevue.....	156.50	729	728
Emsworth.....	153.04	726	725
Dixmont.....	149.77	723	722
Glendale.....	149.30	722	721

a Pittsburgh Union Depot.

STATIONS.	+Lake Erie	Ocean Level.	Ocean Level.
Haysville .....	149.30	722	721
Sewickley .....	164.30	737	736
Edgeworth .....	152.80	726	725
Leetsdale .....	143.44	716	715
Fair Oaks .....	143.44	716	715
Economy .....	143.44	716	715
Economy Switch .....	143.44	716	715
Baden .....	138.24	711	710
Remington .....	138.24	711	710
Freedom .....	130.94	704	703
Rochester (b).....CCCLV	134.24	707	706
New Brighton .....	178.12	751	750
Beaver Falls .....	198.83	772	771
Sullivan .....	293.15	866	865
Wallace Run .....	322.84	896	895
Homewood (c).....CCCLIX	376.76	950	949
Highland .....	471.28	1044	1043
Summit Cut .....	481.71	1055	1054
Darlington .....	408.85	982	981
New Gallilee .....	385.29	958	957
Enon (d) .....	421.61	995	994
State Line .....	472		
Palestine .....	455	995	994
Leslie's Run .....	479		
New Waterford .....	503		
Bull Creek .....	515 $\frac{1}{2}$		
Columbiana .....	555		
Mill Creek .....	534		
Beaver Creek .....	487 $\frac{1}{2}$		
Green Creek .....	461		
Gr. Cr. Siding .....	454		
Middle York .....	461		
Franklin .....	506		

b Junction with Cleveland and Pittsburgh.

c New Castle Branch R. R.

d From here on the figures on page of the Geol. Survey of Ohio, Vol. I, 1873. Between Columbiana and Franklin is a station now called Leetonia where the New Lisbon R. R. joins. Neither name nor elevation of this point is given, and therefore no connection can be made with Warren by this line.

#### CCCLIV. Ohio River Water Levels.

Elevation of points above tide from report of Col. W. Milnor Roberts to Canal Commissioners, November, 1840.

	+Lake Erie	Ocean Level.	
Ohio River at Beaver .....	93	666	
New Castle Pool .....	222	795	
Conneaut Lake .....	509.50	1082.50	
Franklin (a) .....	381.50	954.50	
Allegheny River at Pittsburgh (b)	120.50	693.50	

a This datum is especially valuable in the final determination of the absolute level of the Allegheny Valley R. R. system centering here. But the



CCCLV. *Cleveland and Pittsburgh R. R.*

Levels of the Cleveland and Pittsburgh R. R., were copied from profile in office of Mr. Isaiah Linton, Chief Engineer, Ravenna, Ohio.

Datum: Lake Erie; 573' above Ocean level.

STATIONS.		Above Lake Erie.	Above Tide.	
Rochester (a)..CCCLIII		137	710	
Beaver (b) .....	138	137	710	
Industry.....	125	128	701	
Smith's Ferry.....	125	126	699	
Ohio State Line .....		133	706	
Liverpool.....	120	120	693	
Wellsville .....	115	115	688	
Linton.....	121	121	694	
Hammondsville .....	115	115	688	
Salineville .....	306	306	879	
Yellow Creek (as below)				
Yellow Creek Summit..	543		1116	
Sandy Summit.....	612		1185	
Bayard .....	503		1076	
Mahoning Summit.....	627		1200	
Alliance .....	516		1086	
Beech Creek (water)....	446		1019	
Beech Creek (rail).....	471		1044	
Lima.....	525		1098	
Atwater.....	560		1133	
Summit in Atwater.....	603		1176	
Rootstown .....	550		1123	
Ravenna Public Square..	560		1133	
Ravenna Station.....	530		1103	
P. & O. Canal .....	495		1068	
P. & O. Canal, rail on bridge .....	509		1082	
Cuyahoga River water..	456		1023	
Cuyahoga River bridge..	474		1047	
Hudson Village.....	547		1120	
Hudson Station.....	480		1053	
Macedonia .....	420		993	
Tinker's Creek, (below rail).....	120		693	
Tinker's Creek.....	248		821	
Bedford.....	368		941	
Mill Creek.....	210		783	
Newburg .....	224		797	
Cleveland Euclid street avenue .....	95		668	
Cleveland Machine shop	56		629	

a Junction with Pitts. Ft. W. & Chicago R. R. 137, (710) is at 350 feet from east end of Bridge. At Rochester Station of that road the elevation is 707.24.

b At Beaver commences a series of levels taken from page 669 of Vol. I, Ohio Geology, 1873.

height of the R. R. track about Allegheny River water at Franklin has not been obtained.

b Mr. Gardner quotes from report of City Engineer, March 15, 1871, (page 655, Hayden's Report of 1873), for Pittsburgh:

Low water, City Datum .....	699.20
High water, 1852 .....	729.88
High water, 1832 .....	732.95

## CCCLVI. River Division C. &amp; P. R. R.

STATIONS.	+Lake Erie	Ocean Level.
Yellow Creek (as above) (a) .....		
McCoy's.....	111	684
Elliotsville.....		
Sloan's.....	125	698
Jeddo.....		
Brown's .....		
Steubenville (b).....CCCL	90	663
Mingo Junction.....		
Lagrange.....		
Rush Run.....		
Portland.....	90	663
Yorkville.....		
Deep Run.....		
Martin's Ferry .....	86	659
Bridgeport (c).....CCLVI		
Bellaire (d).....CCLVI	82	635

a Down the west bank of the Ohio.

b Junction with Pittsburgh, Cincinnati and St. Louis.

c Junction with Baltimore and Ohio R. R.

d Junction Central Div. Balt. and Ohio R. R.

## CCCLVII. Beaver Levels.

Bench Marks in vicinity of Beaver, Pa., furnished by Mr. James Harper, County Surveyor, who received the information from notes of Mr. J. N. Hoag, U. S. Engineer.

*Bench Marks.*

- 23 Cross cut on door sill of National Plow Company's building in Rochester, west door, river front.....690.365
- 26 N. E. corner French and Quay's fire brick works, main building, opposite Beaver station on east end top of rubble masonry. Cut on top of rock with cross beside it.....688.946
- 25 Cut and marked with a cross on a flat stone 40 feet from foot of alluvial bank toward river, and opposite a point 50' west of west end of platform at Beaver station.....670.348

The above levels were brought from Pittsburgh from a Bench, whose reference above main tide was given by the City Engineer, as determined by the Pennsylvania R. R. level.

## CCCLVIII. New Castle and Beaver Valley R. R.

Levels on the New Castle and Beaver Valley R. R., were obtained at Pittsburgh, Pa., through the kindness of Mr. F. S. Slataper, Chief Engineer, P. F. W. & C. R. R. (Late survey).

Datum: Lake Erie, 573' above Ocean level.

This is part of the Ashtabula, Youngstown and Pittsburgh R. R.

STATIONS.	Lake Erie.	Ocean Level.
Homewood (a).....CCCLIII	376.76	950
Clinton .....	326.97	900
Thompson's.....	286.53	860
Wampum.....	228.44	801
Newport .....	239.36	812
Moravia .....	233.02	806
Lawrence Junction (b).....	201.09	774
Mahonington .....	216.04	789
New Castle (c).....	230.29	803
Covert's Mills .....	217	790
Edenburg.....	229.6	803
Seymour.....	224.3	797
Hilltown .....	225.6	799
Quakertown.....	244.2	817
Lowell .....	252.8	826
Nebo .....	266.5	839
Struthers.....	263	836
Haselton .....	257.9	831
Youngstown.....	264.4	837
Brier Hill.....		
Girard.....		
Niles .....		
Warren .....		
A. & G. W. R. R. (d).. CCCLXV		
Champion.....		
Bristolville .....		
Oakfield .....		
Bloomfield.....		
Orwell .....		
Rock Creek.....		
Eagleville.....		
Austenburg.....		
Ashtabula (e) .....CCCLXIII		

*a* Pittsburgh, Fort Wayne and Chicago R. R.

*b* Junction with Erie and Pittsburgh R. R. at Lawrence. *R. R. track at this point 40' above water in river.*

*c* Junction with New Castle and Youngstown Branch of Pitts. Ft. Wayne and Chicago R. R.

*d* Atlantic and Great Western R. R.

*e* Lake Shore and Michigan Southern R. R.

### CCCLXVIII. Beaver Coals, &c.

Levels of Coal Basins and other points from report of W. G. Darley, Chief Engineer of New Castle and Franklin R. R., Oct. 7, 1864.

	Above Lake Erie.	Above Ocean Level.	
New Castle.....	220	793	
Brier Hill (Mahoning Valley)....	356	929	
Hottenburgh Lower Vein.....	520	1093	
Sandy Lake.....	740	1313	
Sandy Lake, Lower Vein.....	540	1113	
Harrisville.....	806	1379	
Gillande Summit.....	576	1149	
Franklin.....	417	990	
Mercer.....	500	1073	

*CCCLIX. New Castle and Franklin R. R.*

Levels of the New Castle and Franklin R. R., were copied from a profile of the road furnished by Mr. A. Vandivoort, Supt.

Datum: Lake Erie, 573' above Ocean level.

STATIONS.	+Lake Erie	Ocean Level.	
New Castle (a).....CCCLVIII	220.50	793	
Eastbrook.....	333	906	
Graham's.....	334	907	
Wilmington.....	355	928	
Neshanock Falls.....	419	992	
Volante.....	462	1035	
Leesburg.....	472	1045	
Nelson.....	487	1060	
Hope Mills.....	534	1107	
Mercer (b).....CCCLXI	524	1097	
Turner's.....	571	1144	
Jackson Centre.....	684	1257	
Garvin.....	754	1327	
Summit.....	815	1388	
Coulson.....	704	1277	
Stoneboro (c).....CCCLXIII	598	1171	

*a* Junction with New Castle and Beaver Valley R. R.

*b* Junction with Shenango and Allegheny R. R.

*c* Junction with Franklin Division L. S. & M. S. R. R.

*CCCLX. Erie and Pittsburgh R. R.*

Levels on the Erie and Pittsburgh R. R. were copied from the profile in the office at Erie, through the kindness of Mr. E. N. Beebout, Asst. Engineer.

Datum: Lake Erie. 573' above Ocean level.

*a* Junction with New Castle and Youngstown Branch of Pittsburgh, Fort Wayne and Chicago R. R. Table CCCLVIII.

*b* Crossing of A. & G. W. R. R. See Table CCCLXV.

*c* Crossing, Franklin Division, L. S. & M. S. R. R. See Table CCCLXII.

STATIONS.	+ Lake Erie	Ocean Level.	
New Castle (a).....CCCLVIII	236	809	
Harbor Bridge.....	243	816	
Nashua.....	248	821	
Pulaski.....	253	826	
Middlesex.....	260	833	
Wheatland.....	268	841	
Sharon.....	280	853	
Sharpsville.....	375	948	
Clarksville.....	321	894	
Transfer.....	417	990	
A. & G. W. R. R. Crossing (b) CCCLXV.....	357	930	
Shenango.....	368	941	
Greenville.....	388	961	
Jamestown (c).....CCCLXII	406	979	
Kasson's.....	538	1111	
Espyville.....	515	1088	
Linesville.....	460	1033	
Summit (d).....	586	1141	
Conneautville.....	493	1066	
Spring.....	388	961	
Albion.....	284	857	
Crosses.....	192	765	
Girard (e).....CCCLXIII	124	697	
Fairview.....			
Swansville.....			
Erie.....CCCLXIII			

d The elevation given at a point near Summit is 573' above Lake Erie = 1146' above Ocean level.

e Junction with L. S. & M. S. R. R. near Girard.

### CCCLXI. Shenango and Allegheny R. R.

Levels on the Shenango and Allegheny R. R. were furnished through the kindness of Mr. Aug. Mordecai, Assistant Engineer A. & G. W. Railway, Meadville, Pa.

Datum: Lake Erie. 573' above Ocean Level.

STATIONS.	+ Lake Erie	Ocean Level.	
Harrisville.....	767	1340	
Pinegrove.....	677	1250	
Pardoe.....	632	1205	
Mercer.....	535	1108	
Cool Spring.....	554	1127	
Freedonia.....	604	1177	
New Hamburg.....	585	1158	
Shenango.....	364	937	
Greenville (a).....CCCLX	388	961	

a The Shenango and Allegheny R. R. connects with the Erie & Pittsburgh R. R. at Greenville.

## CCCLXII. Franklin Division, Lake Shore.

Levels on Franklin Division of Lake Shore and Michigan Southern R. R. were copied from the profile in the office of the Company at Cleveland, Ohio, by permission of Mr. J. D. Hawks, Asst. Engineer.

Datum: Lake Erie. 573' above Ocean level.

STATIONS.	+ Lake Erie	Ocean Level.
Oil City, east ( <i>a</i> ).....CCCI	436.80	1010
Oil City ( <i>b</i> )..CCCIV, CCCLXVII	436.80	1010
Reno ( <i>c</i> ).....CCCLXVII	444.50	1017
Two Mile Run.....	422.00	995
Franklin ( <i>d</i> ).....CCCLXVII	444.06	1017
Midway.....	423.01	996
Summit.....	592.02	1165
Polk.....	511.07	1084
Raymilton.....	564.88	1138
Midway.....	600.88	1174
Naples.....	591.78	1165
Stoneboro.....	598.08	1171
Coal Branch.....	626.08	1199
Clark's.....	591.30	1164
Hadley's.....	497.09	1070
Salem.....	424.51	998
A. & G. W. R. R. Crossing ( <i>e</i> ) CCCLXV.....	414.10	987
Midway.....	510.00	1083
Jamestown ( <i>f</i> ).....CCCLX	416.78	990
Turner's.....	487.37	1060
Simond's.....	483.72	1057
Williamsfield.....		
Andover.....	522.20	1095
Richmond.....		
Dorsett.....	444.78	1018
Jefferson.....	368.07	941
Plymouth.....	281.20	854
Ashtabula ( <i>g</i> ).....CCCLXIII	74.52	648

*a* Connects with Allegheny Valley R. R. See Table CCCI.

*b* Connects with Oil Creek and Allegheny River R. R., see Table CCCIV, and with Franklin Branch of the Atlantic and Great Western R. R. See Table CCCLXVII.

*c* Connects with Franklin Branch of the Atlantic and Great Western R. R. See Table CCCLXVII.

*d* Connects with Franklin Branch of the Atlantic and Great Western R. R. See Table CCCLXVII.

*e* Crossing, Atlantic and Great Western R. R. near Salem. See Table CCCLXV.

*f* Crossing, Erie and Pittsburgh R. R. See Table CCCLX.

*g* Junction with Main Line of L. S. & M. S. R. R.

## CCCLXIII. Lake Shore and Michigan Southern R. R.

The elevations of the Lake Shore and Michigan Southern R. R. were obtained at Cleveland, Ohio, through the kindness of Mr. J. D. Hawks, Assistant Engineer.



Datum : Lake Erie. 573' above Ocean level.

STATIONS.	+ Lake Erie	Ocean Level.
Dunkirk ( <i>a</i> ).....CLXII, CCCVI	24.94	598
Morian's.....	53.15	626
Brockton ( <i>b</i> ).....CCCVI	151.11	724
Portland.....	121.24	694
Westfield.....	123.66	697
Ripley Crossing.....	163	736
Ripley.....	176.75	750
State Line.....	212.18	785
Northeast.....	231.4	804
Moorhead's.....	194.6	768
Harbor Creek.....	157.	730
Wesleyville.....	123.55	697
Erie ( <i>c</i> ).....CCXV	112.5	686
Swanville.....	162	735
Fairview.....	162	735
Girard ( <i>d</i> ).....CCCLX	143.72	717
Springfield.....	90	663
Conneaut.....	78	651
Amboy.....	107.75	681
Kingsville.....	98.40	671
Ashtabula ( <i>e</i> ).....CCCLX	74.52	648

*a* Connects at Dunkirk with Erie R. R., Table CCXII, and with the Dunkirk, Allegheny Valley and Pittsburgh R. R. See Table CCCVI.

*b* Connects at Brockton with the Buffalo, Corry and Pittsburgh R. R. See Table CCCIX.

*c* Connects at Erie with Philadelphia and Erie R. R. See Table CCXV.

*d* Connects at Girard with the Erie and Pittsburgh R. R. See Table CCCLX.

*e* Franklin Division diverges from the Main Line at Ashtabula. See Table CCCLXII.

#### CCCLXIV. Erie City Levels.

Elevations of points in the City of Erie, Pa., were furnished by Mr. Irvin Camp, City Engineer.

Datum : Lake Erie. 573' above Ocean level.

STATIONS.	Above Lake Erie.	Ocean Level.
Chestnut Street, at Second Street (Lake Bluff).....	70	643
Chestnut and 26th Street.....	190	763
Water in Reservoir, City Water Works.....	235	808

#### CCCLXV. Atlantic and Great Western R. R.

The levels on Atlantic and Great Western Railway were copied from a profile of road in the office of the Company at Meadville, Pa.

Datum: Lake Erie. 573' above Ocean level.

STATIONS.	Above Lake Erie.	Ocean Level.
Salamanca ( <i>a</i> ).....CLXII	811 ?	1384
Bucktooth.....	798	1371
Red House.....	771	1344
Cold Spring.....	785	1358
Steamburg.....	831	1404
Randolph.....	702	1275
Waterboro.....	690	1263
Kennedy.....	676	1249
Poland.....	694	1267
Levant.....	683	1256
Jamestown ( <i>b</i> ).....CCCVI	748	1321
Ashville.....	777	1350
Panama.....	855	1428
State Line.....	835	1458
Freehold.....	974	1547
Columbus.....	864	1437
Corry ( <i>c</i> )..CCCIV, CCCV, CCCIX	866	1439
Concord.....	780	1353
Union.....	724	1297
Mill Village.....	630	1203
Miller's.....	579	1152
Cambridge.....	585	1158
Venango.....	556	1129
Saegertown.....	534	1107
Meadville.....	504	1077
Franklin Junction Branch ( <i>d</i> ) CCCLXVII.....	497	1070
Sutton's.....	526	1099
Evansburg.....	707	1280
Adamsville.....	572	1145
Sugar Grove.....	449	1022
Greenville.....	384	957
Shenango ( <i>e</i> ).....CCCLXI	371	944
Transfer ( <i>f</i> ).....CCCLX		
Clarksville.....	412	985
Crawford's.....	318	891
Orangeville.....	370	943
Burghill.....	483	1056
Johnson's Summit.....	553	1126
Baconsburg.....	390	963
Warren.....	327	900
Leavittsburg ( <i>g</i> ).....CCCLXVI	322	895

*a* Junction with Erie R. R. See Table CLXII.*b* Crossing, Dunkirk, Allegheny and Pittsburgh R. R. See Table CCCVI.*c* Junction with O. C. & A. R. R.; see Table CCCIV. Philadelphia & Erie R. R., Table CCXV. Buffalo, Corry and Pittsburgh R. R., CCCIX.*d* Franklin Branch of A. & G. W. R. R. diverges from Main Line three miles southeast of Meadville. See Table CCCLXVII.*e* Junction with Shenango and Allegheny R. R. See Table CCCLXI.*f* Crossing, Erie and Pittsburgh R. R. See Table CCCLX.*g* Junction with Mahoning Division of A. & G. W. R. R. See Table CCCLXVI.

*CCCLXVI. Mahoning Division, A. & G. W. R. R.*

STATIONS.	Above Lake Erie.	Ocean Level.	
Colman's ( <i>a</i> ).....	265	838	
State Line.....	259	832	
Hubbard's.....	328	881	
Veach Mine.....	350	923	
Doughten's.....	384	957	
Thornhill.....	280 ?	853	
Youngstown.....	290	863	
Brier Hill.....	338	911	
Girard.....	310	883	
Niles ( <i>b</i> ).....	336	909	
Warren ( <i>c</i> ).....	327	900	
Leavittsburg.....	322	895	
Braceville.....	340	913	
Windham.....	372	945	
Garrettsville.....	455	1028	
Mantua.....	536	1109	
Aurora.....	515	1088	
Pond.....	450	1023	
Solan.....	457	1030	
Plank Road.....	469	1042	
Newburg.....	240	813	
Cleveland.....	24	597	

*a* Junction with Main Line, A. & G. W. R. R.

*b* Junction with Niles and New Lisbon R. R.

*c* Junction with Main Line, A. & G. W. R. R.

*CCCLXVII. Franklin Branch, A. & G. W. R. R.*

STATIONS.	Above Lake Erie.	Ocean Level.	
Junction ( <i>a</i> ).....	497	1070	
Shaw's Landing.....	524	1097	
Cochranon.....	488	1061	
Evan's Bridge.....			
Utica.....	457	1030	
Sugar Creek.....	430	1003	
Franklin ( <i>b</i> )... ..CCCLXII	399	972	
Reno.....	441	1014	
Oil City ( <i>c</i> ).....CCCI, CCCIV	422	995	

*a* Junction with Main Line A. & G. W. R. R. about three miles southeast of Meadville.

*b* Connects with the Franklin Division of the L. S. & M. S. R. R. See Table CCCLXII.

*c* Junction with Allegheny Valley R. R., Table CCCI; and with Oil Creek & Allegheny River R. R. See Table CCCIV.

*CCCLXVIII. Sharon Branch, A. & G. W. R. R.*

STATIONS.	Above Lake Erie.	Above Tide.	
Junction (a).....	329	902	
Sharon.....	285	858	
End of Road.....	275	848	

a Junction with Main Line, A. & G. W. R. R., near Sharon.

## APPENDIX.

*Mountain Summit Levels.*

Statement of elevations of Summits of dividing grounds of Eastern and Western Waters.

SUMMITS.	Tide.	Ocean Level.	
Nescopeck, N. P. R. R.....	1635		
Elk & West Creek, P. & E. R. R.	1677		
Sugar Run Gap.....	2161		
West of Olean, N. Y. & E. R. R..	1672		
Blair's Gap, Allegheny & Portage Railroad.....	2339		
Wilson's Gap, B. & O. R. R.....	2620		
Sand Patch, P. & C. R. R.....	2290		
Clarion, P. & E. R. R.....	1979		
Catawissa Extension of Little Schuylkill R. R. ....	1450		
Elmira, N. Y. & E. R. R.....	1419		
Chambersburg & Pittsburgh (a).	2547		

NOTE.—The above levels were copied by Mr. G. W. Leuffer from Mr. Strickland Kneass' memorandum, April 4th, 1866, and are supposed by Mr. Leuffer to be from surveys made by Col. Charles H. Schlatter, in 1833 or 1839.

a Summit between Chambersburg and Pittsburgh, on turnpike.

*Clearfield County Levels.*

Statement of levels in the Clearfield Region furnished by Mr. E. M. Leuffer, Civil Engineer. Add 3' for Ocean level.

STATIONS.	Tide.	Ocean Level.	
Tyrone Junction of T. & C. R. R. and Pa. R. R.....	892	895	
Vanscoyoc.....	1402	1405	
Gardner's.....	1553	1556	
Mt. Pleasant.....	1759	1762	
Emigh's Gap Summit.....	2025	2028	
Emigh's Gap Summit, Natural Surface of ground.....	2036	2039	
Osceola.....	1473	1476	
Pool, Osceola Dam.....	1444	1447	

STATIONS.	Tide.	Ocean Level.
Mouth of Beaver Run.....	1444	1447
“ Bear Run.....	1467	1470
“ Mountain Branch.....	1485	1488
“ Whiteside's Run.....	1488	1491
“ Wilson Run.....	1633	1636
Crest of Allegheny Mountain at Middle Summit, 3 Spring Gap and source of Moshannon Cr.	2233	2236
Crest of Allegheny Mountain at Northern Summit, 3 Spring Gap.....	2278	2281
Crest of Allegheny Mountain, one mile east of Northern Summit, 3 Spring Gap, and highest ground.....	2611	2614
Crest of Allegheny Mountain in gap between north fork of Sinking Run and Mountain Branch..	2406	2409
Crest of Allegheny Mountain in gap between Laurel Run and tributary of Mountain Branch..	2364	2367
Crest of Allegheny Mountain in gap between Bear Run and Mount Pleasant Run.....	2221	2224
Hale's Coal Bank.....	1638	1641
Davis' Coal Bank on pike, two miles east of Janesville.....	1670	1673
Little Muddy Run at pike crossing near Janesville.....	1450	1453
Whiteside's Gap in divide between Moshannon & Clearfield waters	1618	1621
Confluence of Big and Little Muddy Runs.....	1321	1324
Spruce Flat Summit in divide between Beaver Run and Clearfield waters.....	1603.5	1607
Confluence of Big Muddy and Clearfield Creek, near Madeira.	1302	1305
Houtzdale, Level of top of rail of Railroad at Depot.....	1492	1495
Franklin Colliery Level of bottom of Coal Vein.....	1526	1529
Surface of water in Clearfield Creek at Glen Hope.....	1319	1322
Surface of water in Big Muddy Run at turnpike crossing, 1½ mile west of Janesville.....	1345	1348
Hagerty's cross roads.....	1568	1571
Stephen's Summit in Clearfield and Moshannon divide.....	1722	1725
Sand Spring, source of the Mountain Branch.....	2428	2431
Moshannon Mines three miles west of Osceola (?).....	1465	1468

*Centre County Levels.*

Elevations of points on experimental line from Bellefonte to Spring Mills, by Mr. J. L. Sommerville, R. E., Bellefonte and Snow Shoe Railroad.  
Add 7' for Ocean Level.

STATIONS.	Tide.	Ocean Level.	
Crossing Nittany Mountain at Heckley Furnace.....	1867	1874	
Head of Penn's Creek (water) ...	1129	1136	
Spring Mills intersection with L. C. & S. C. R. R.....	1072	1079	
Bellefonte and Lewistown turn-pike crossing, Nittany Mountain .....	1650	1657	

*CVII. Lehigh and Susquehanna R. R.*

See page 43 above.

The following tables have just been received from Mr. John W. Crellin, A. E., in a letter dated, Mauch Chunk, May 1, 1876.

STATIONS.	Elevations.	Ocean Level.	
Top of rail L. V. Track .....			
Phillipsburg .....	217.4		
Easton .....	215.1		
Glendon .....	215.06		
Hopes .....	219.51		
Freemansburg.....	221.73		
Bethlehem.....	235.54		
Bethlehem Junction .....	239.35		
Allentown .....	257.23		
Lower Catasaugu .....	271.02		
Upper Catasaugu.....	283.53		
Lauback's.....	303.82		
Siegfried's Bridge.....	315.03		
Priechler's .....	343.95		
Lockport .....	356.42		
Walnut Port.....	371.43		
Lehigh Gap.....	392.73		
Hazardville.....	416.83		
Bowmansville .....	435.77		
Parryville.....	443.33		
Weissport .....	475.50		
Leighton .....	493.71		
Mauch Chunk.....	532.3		
Coal Port.....	584.7		
Penn Haven Junction.....	708		
Penn Haven.....	723.9		



*CIX. Nesquehoning Valley R. R.*

See page 44, above.

STATIONS.	Elevations.	Ocean Level.	
Nesquehoning.....	801.116		
Hauto .....	1005.19		
Hometown ...	1175.64		
Hawk Switch.....	1221.43		
Pamanend .....	1287.43		

*CXII. Lehigh and Lackawanna R. R.*

See page 45, above.

STATIONS.	Elevations.	Ocean Level.	
Bethlehem Junction .....	239.35		
Shimer's .....	289.129		
Ritter's.....	298.67		
Brodhead's .....	313.077		
Steubens' .....	333.257		
Clyde.....	362.387		
Bath .....	422.687		
Chapmansville .....	575.927		





















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